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AVAILABLE FROM	Judith Lashof, Rutland Adult Learning Center, VISR, 128 Merchants Row, Room 205, Rutland, VT 05701.
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ABSTRACT

The Vermont Institute for Self Reliance (VISR) conducted a Basic Educational Skills for Training (BEST) program, a national demonstration project in workplace literacy, from April 1990 to March 1992. BEST provided learner-centered, context-based literacy instruction onsite, on company time, at two General Electric (GE) Aircraft Engines Rutland sites and two Burlington Electric Department (BED) sites in Burlington. Enrollment was open entry, open exit; employee participation was voluntary. Workplace texts were transformed into Responsive Text, a computer-augmented reading environment, and used to teach workplace literacy. An external evaluation reported the following results: the program significantly increased the literacy levels of program participants; it resulted in important gains on a variety of work performance measures; and Responsive Text was a powerful tool for simultaneously developing literacy and improving work performance. (Appendixes to the evaluation report are the portfolios developed to assess participants at GE and BED. These portfolios include a number of assessment instruments: preparticipation interview form, reading assessment, and writing sample; postparticipation interview form, reading assessment, and writing sample; teacher's perception of improvement scale; employee/participant self-evaluation form; supervisor's response form; and Responsive Text evaluation form.) (YLB)

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WORKING TOGETHER

FOR ADULT LITERACY IN VERMONT

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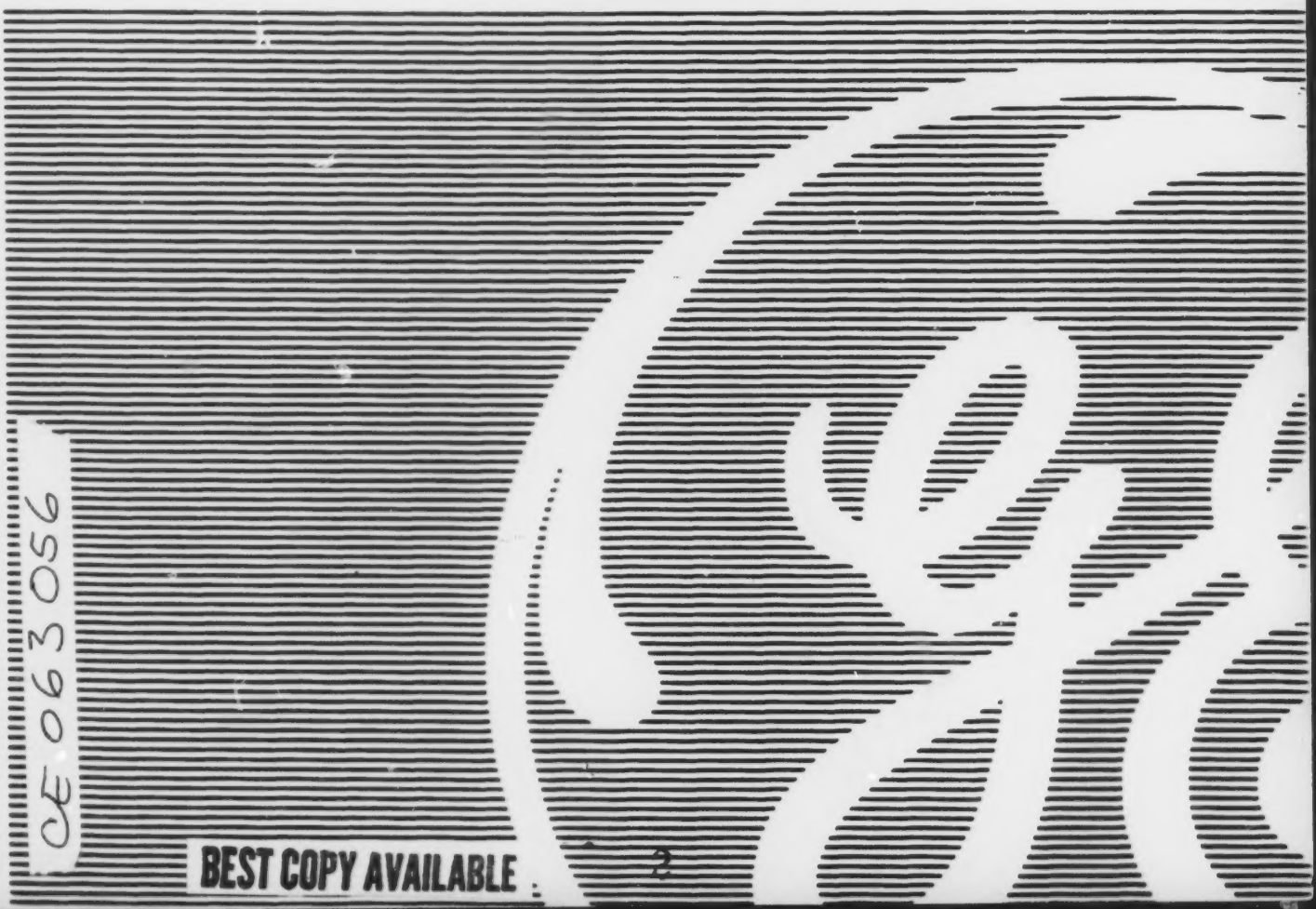

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Final Performance Report

for

BEST

A Learner-Centered Workplace Literacy Partnership

of

The Vermont Institute for Self-Reliance

and

General Electric Aircraft Engines Rutland,VT

Prepared by

Judith R. Lashof,

Project Director, VISR

December 18, 1992

For more information or additional copies contact:
Judith Lashof
Rutland Adult Learning Center, VISR
128 Merchants Row, rm 205
Rutland, VT 05701
802-775-0617

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A. Overview of BEST - A Learner-Centered Workplace Literacy Partnership

1. Introduction

This is a final report on the Vermont Institute for Self-Reliance's (VISR) Basic Educational Skills for Training **(BEST)** program, a national demonstration project in Workplace Literacy conducted from April 1, 1990 to March 31, 1992. The project was a partnership of VISR (the education provider), General Electric Aircraft Engines Rutland and the Burlington Electric Department (BED). Primary contractors were LexIcon Systems, provider of the Responsive Text customized computer software and Dr. Don Leu, External Evaluator. Since April 1992, the BEST project has continued on a contract basis to serve GE. Funding is now pending for a 1993 National Demonstration Workplace Literacy Grant to expand BEST to include the John A. Russell (Construction) Corporation and the Rutland Regional Medical Center. Articles and two short videos are available about aspects of the program, see Dissemination Activities (B. 3.).

The project provided learner-centered, context-based literacy instruction on site, on company time at the two GE sites in Rutland and the two BED sites in Burlington. Enrollment was open entry, open exit. Employee participation was voluntary and each employee met with the project director or instructor for individual goal setting and assessment. Workplace texts were transformed into Responsive Text, a computer augmented reading environment and used to teach workplace literacy. One full-time instructor served GE and a half-time instructor served BED. A half -time project director managed the project at both sites. At each site the project team consisted of the Project Director, Judith R. Lashof, instructor (Sara Randolph at GE, Ernest Brill at BED), software developer, Michael L. Hillinger and at GE the training coordinator, Joyce Vachon, at BED the Director of Human Resources, Anita J. Schmidt and Human Resources Specialist, Kathryn L. Booth.

2. The Partners

GE Aircraft Engines Rutland is a heavy manufacturing plant which at the start of the program employed 2,300. It is Rutland's largest and best paying employer. GE is competing in a world market that includes European consortiums, Japan, Israel, Turkey, Australia and Canada. GE has seen engine components grow more complicated, the manufacturing process more critical, and work instructions more detailed. GE is in the process of transforming itself to a high performance, high involvement workplace based on the principals of Total Quality Management, or as it is called at GE, Socio-Tech. Learning and problem solving on the job are becoming more demanding as GE forms work teams to increase people's involvement in decision making and transitions to multiskilled work packages which require every employee to learn additional skills.

This transformation process was still in its beginning stages in 1989 when GE joined forces with Vermont ABE/VISR to design a workplace literacy program and write this grant. This change effort, especially the redesign of the work at GE is now 80% complete. At the start of the project (GE has recently laid off 400 employees) the GE workforce was 70% male and 30% female and employees averaged 15 years of

service. BEST planned to provide a total of 8,640 hours of literacy instruction to 48 GE employees in each of three six month cycles. BEST served 21 GE employees in the first cycle, and the numbers increased steadily until 50 were served in a fourth cycle during the last 3 months of a six month grant extension. In July 1992, three months after the end of the grant 60 employees were being taught by BEST at GE's expense. Because GE was not able to implement the brush-up classes as planned, only 55 GE employees participated in them although the plans called for serving 150. Employees participated for a total of 5,330 instructional hours.

BED is a public power utility which provides electricity to Burlington, Vermont. Its 175 employees include engineers, foresters, electricians, mechanics, meter readers, janitors, clerks and power analysts. BED serves over 18,000 customers via its electrical transmission and distribution system and operation of the McNeil Generating Station, a 53 megawatt wood chip-fired electricity generating facility. The BED workforce is 73% male and 27% female and employees average 12 years of service. BEST planned to provide a total of 1,600 hours of literacy instruction to 20 BED employees through the learning lab. BEST served 11 employees through the lab and 64 additional employees in short brush-up workshops. Employees participated for a total of 658 instructional hours.

VISR is a private nonprofit community-based educational organization. It's purpose is to help adults gain knowledge, skills and confidence to reach their personal and educational goals and expand their options and decision making capabilities as individuals, family members, citizens and workers. For more than a decade VISR has provided Distance Education for ABE/GED students in Vermont and conducted special projects for Vermont Adult Basic Education. In July 1991, VISR greatly expanded to provide comprehensive adult basic education services and related workplace, family and homeless literacy programs to more than half of Vermont.

3. Assessment and Instruction

Each potential participant was individually interviewed and assessed. This assessment used a holistic instrument developed by the project which explored the employee's experience with reading and writing tasks on the job. Actual texts from the workplace--ranging from signs in context (i.e. CAUTION HOT) to selections from technical training manuals were used to measure decoding and comprehension abilities. (See appendix 1.)

At the two GE plants, learner-centered small group instruction in reading and writing was offered on all three shifts. Learner's were grouped according to their skills and goals. Instruction in reading strategies and vocabulary incorporated the Responsive Text software (see below). Learner's also used other workplace materials, the Opening Doors Books (written by Vermont ABE students), language experience stories, newspapers, and dialogue journals.

At BED the shift workers at the electric generating plant worked rotating shifts, and the office staff (at a site across town) worked days only. Ongoing instruction at BED was individually scheduled to fit around a worker's busy times and was one-on-one

or in groups of four or less. An important addition not in the original plan for BED, was a series of workshops tailored to the needs of specific departments. These were conducted for brush-up, program visibility and recruitment. At BED because of the higher skill level of employees, writing skills were taught equally with reading comprehension which was taught as it was at GE. In addition study skills for the CDL exam were taught.

Responsive Text

Responsive Text is a computer augmented reading environment which presents job -related materials in a more accessible format. Responsive Text begins with what we know about the reading process. Good reader's bring many skills to bear in reading. Among them: fluent decoding, background knowledge, inferencing, and comprehension monitoring. Responsive Text supports poor readers so that they can read as good readers do. Under the control of the reader, the computer assists with the above skills. Four categories of help are available.

1. To aid decoding, **Speech** support is available--unfamiliar words can be spoken by the computer.

2. To fill gaps in the reader's background knowledge, brief definitions are available for underlined words. The **More About** option provides more extensive information.

3. **Closeup** windows can provide a rewording or pictorial representation of the text, to explain difficult passages.

4. **Checkup** questions are distributed throughout the text to allow readers to test their understanding of the text and to encourage comprehension monitoring.

Eleven Responsive Text chapters were developed for and used at GE. Each chapter was transformed from manuals written by GE Rutland's in-house training group. No such manuals existed at BED. Instead, Responsive Text was developed from generally available materials related to the work of the electric utility. Three chapters were developed for BED. The material for the Responsive Text were chosen by the project team at each site. See appendix 6.c. for a detailed description of Responsive Text and appendix 4 for a listing of the chapters produced.

4. Evaluation

The evaluator's report found that:

"1. The program at GE and BED significantly increased the literacy levels of program participants.

2. The program at GE and BED resulted in important gains on a variety of work performance measures.

3. Responsive Text is a powerful tool for simultaneously developing literacy and improving work performance."

In addition, during the course of the project the following unanticipated findings developed:

1. *The crucial link between workplace education and a high performance organization.* The most valued impact of the BEST program on productivity was from increased employee involvement. Employees and supervisors both reported statistically significant increases in initiative, leadership, job knowledge and self-confidence.

2. *The critical link between training methods and materials and employees' perceived needs.* Not all job-related materials are relevant to all employees. Participants reported the most interest in materials that were clearly seen as relevant to their job (e.g., a lesson on the commercial driver's license) while they had less interest in material seen as out of date. Perhaps the most interesting implication of the Responsive Text environment is that it blurs the distinction between learning basic skills and learning job-related skills. The ideal application for Responsive Text could be as a training aid for all workers, enabling each to explore and gain assistance only to the level of his or her particular need.

3. *The need to develop employee ownership of the program and awareness of its purpose.* As the project progressed participants provided many useful insights. Because the programs at GE and BED were voluntary, recruitment became a key issue. While both sites were initially low key in publicizing the program, it soon became clear that employee awareness and involvement was the best recruitment tool. At GE participation increased 60%, after an employee committee formed and developed a short recruitment video on the project.

4. *The need to redefine workplace literacy to include all of the basic skills necessary to understand and perform one's job.* To restrict instruction to understanding connected discourse as we initially intended is not enough for the literacy demands of the workplace. To understand most training manuals, reading is a necessary but not sufficient skill. Much of the information is conveyed with graphs, charts, and diagrams. Frequently the material requires some basic skills in math and problem solving.

In conclusion, a successful workplace literacy program is one which creates change in the workplace--change in the corporate culture toward life long learning for the individual and the organization, greater employee self-esteem, involvement and advancement, and improved ability/success with workplace tasks requiring literacy (reading, writing, computation, problem solving and communication.) VISR and its business partners believe the BEST program has created such change.

B. Report on Performance

1. Comparison of actual accomplishments to objectives, reasons for slippage and corrective measures.

Outcome Objectives

Objective # 1: *Increase the literacy levels of targeted individuals especially in regards to workplace reading tasks.*

The evaluator's report found that: "The program at GE and BED significantly increased the literacy levels of program participants (p. ii)." Substantial, statistically significant, gains were documented in both comprehension and composition of workplace materials by teachers, by employees, by employee's supervisors and by objective measures. Early in the project we expanded the above objective to include workplace writing tasks. At BED, where the overall literacy level of participants was higher than at GE, writing improvement received the most attention, while at GE the emphasis remained on reading. Accordingly, the ability to read job-related material was reported as the area of greatest increase by both supervisors and employees at GE. At BED the greatest increase (also reported by both supervisors and employees) was in the ability to write job-related material. Pre-post tests of reading comprehension and writing samples at both GE and BED found statistically significant gains in both areas at both sites.

Objective #2: *Demonstrate that the increased reading ability of literacy class participants results in improved employee performance.*

The evaluator's report found that "the program at GE and BED resulted in important gains on a variety of work performance measures (p. ii))." It is important to note that all involved with the project noted changes in employee behavior and performance that went well beyond increases in on the job reading comprehension and frequency. Both supervisors and employees were asked to report changes in the following areas on a scale of 0 to 4, where 2 = stayed the same:

1. Leadership in the workplace
2. Initiative in the workplace
3. Knowledge of his/her (my) job
4. Self-confidence in the workplace
5. Absenteeism
6. Quality of work
7. Level of responsibility (GE only)

Positive change was reported in all areas except absenteeism which had not been a problem at either GE or BED prior to or during the project. While supervisors at GE reported improvements in quality (M= 2.70) and quantity (M=2.65), they reported greater increases in all the other employee performance areas, especially in self-confidence in the workplace (M=3.36) (p. 26). This outcome takes on added importance in light of the fact that GE is in the midst of transforming the business to total quality management which requires greatly increased participation from all employees to be successful. Although not as pronounced, a similar pattern emerged at BED.

Objective #3: *Evaluate Responsive Text as a tool for enabling individualized instruction within groups, and building reading comprehension, including its effectiveness as a primary learning vehicle for adults needing to brush-up their study skills.*
On the advice of the external evaluator, this objective was re-phrased as "Evaluate the extent to which Responsive Text provides an effective tool for supporting the developing literacy needs of employees in workplace settings." The evaluator's report concluded that "Responsive Text is a powerful tool for simultaneously developing literacy and improving work performance (p. ii)." The report elaborated "Participants found Responsive Text to be useful for developing reading skills, for developing writing skills, for understanding technical documents at work, and for learning new things about work (pp. 35-36)."

Process Objectives

Objective #1: *Identify adult workers who need to improve their basic literacy skills safely in a way which maintains their dignity and breaks down barriers to participation.*

Great care and effort went into the recruitment process at both GE and BED. Furthermore, the service delivery was designed to minimize barriers. Classes were conducted on company time, during employees' shifts at private on-site locations. There was no formal standardized testing and employees' learning needs and progress in class were kept confidential. Because of the great embarrassment and fear about basic education/literacy among the older overwhelmingly white well -paid blue collar workforce at GE, the program was initially presented very quietly. At the start of the project, GE management conducted meetings for all 66 supervisors in which the program was described, behaviors which might indicate reading difficulties were explained, and how to speak to employees about the issue in a positive supportive manner was discussed. Supervisors were asked to refer employees to the program for a private assessment interview. There was no publicity about the program within the plant or in the community. This approach was successful in recruiting 21 participants for the first cycle. As time went on, additional recruitment strategies were added: a similar orientation session for GE teachers of the required multi-skilling classes, posters on the company bulletin boards, announcements at shift start up meetings, articles in the company newsletter and finally and most successfully a promotional video tape was made at company expense, then shown to all employees.

1.1 Recruit 100 to 150 literacy class participants and 150 brush-up participants at GE.

A total of 81 literacy class participants were recruited at GE. Recruitment was by far the most difficult challenge BEST encountered. Slippage was due primarily to changes at GE which became evident as the project got under way. The BEST program was designed to coordinate closely with GE's own classroom training program (multi-skilling classes). At the time of the grant application and at the time of the receipt of the grant award, the multi-skilling classes were, over a period of years, to be required of all 2,300 GE employees. Both the recruitment plan and the Responsive Text were built on the foundation of these classes which would be requiring all employees to read and pass written tests on very technical manuals.

However the number of these classes were scaled back at the time the project started in July 1990 due to production pressures, employee resistance and the recession impacting the aircraft industry. Then, in the fall of 1990 the multi-skilling classes were suspended in order that the company could meet production deadlines by the end of the year. In addition, through observing some of the skills classes and talking with the training coordinator and employees, the project director realized that skills class instructors were reading or having their students read the manuals aloud in class. (The company had learned after the inception of its program that it was illegal to require employees to read the manuals on their own time.) Eventually, the classroom portion of the multi-skilling training was made optional, although the training manuals are still in use.

GE kept its commitment to offer the BEST program entirely on paid company time and never suspended the BEST classes, even when it suspended or curtailed its own training classes in order to meet production deadlines. All the same, individual supervisors and individual employees were understandably reluctant to refer employees/themselves to BEST when other classes were suspended and overtime was mandatory.

This problem was exacerbated by the fact that the GE Manager of Organization Development who developed and championed the grant was promoted to another plant, just as the grant award was received. He saw to it that the training coordinator and an engineer who were both committed to the project took his place. However, even together they did not possess the organizational influence nor the investment in the project that the Manager of Organization Development had had.

At the start of the BEST program the GE engineer and the training coordinator recognized that BEST could not rely on the multi-skilling classes as the primary recruitment vehicle. Thus the first corrective action of enlisting the supervisors to refer employees to the program was taken. This resulted in 12 students starting the BEST program for the first week of classses. Further corrective action was needed. We made the program open enrollment. We went back to the supervisors; we did an orientation for the multi-skilling teachers (who were all GE production workers, not professional teachers); we had announcements made at shift start up meetings. As a result, 9 additional students were recruited for cycle 1.

Continuation of these efforts plus word of mouth from those employees in the classes who were willing to talk about being in BEST, posters on the bulletin boards, support from the supervisors who had employees in the program, and articles in the company newsletter enabled us to recruit 18 new students for cycle 2, increasing the enrollment 50% to 33 students. We explored additional steps such as expanding the program to include GED preparation and capitalizing on the hi-tech appeal of responsive text on Macintosh computers. However, the engineer felt that opening the program to people who could read most of the company materials when the program was entirely on company time would not be acceptable to supervisors and engineers.

During cycle 2, the training coordinator moved to another GE plant, and a new training coordinator was hired by GE. She quickly grasped how vital BEST was to the success of the change effort at GE and ably communicated this to top management and front line supervisors, who were beginning to realize the same thing as they saw the changes in the performance of their employees who were participants in the BEST program.

During cycle 3, the recruitment barrier was broken. The new training coordinator who had then been in the position for a few months was instrumental in this. She approved expanding BEST to include GED preparation. She formed an employee recruitment team as the project director had previously urged. As a result, fourteen new students were recruited for cycle 3, bringing the total enrolled in that cycle to 43.

The employee recruitment team was comprised of employees in the BEST program from both plants and all 3 shifts, the project director and the training coordinator who chaired it. Employees felt that a video would be the most effective form of recruitment. The training coordinator secured the enthusiastic participation of the professional video crew at GE headquarters. Once the 6 month extension of the grant was approved, a fourth cycle was added (January - March 1992). The video was released during this cycle resulting in 10 new participants immediately. The video spurred employee recruitment beyond the end of the grant period (GE is continuing the program with its own funds).

Only 55 brush-up participants were recruited at GE, in large part due to difficulty in implementing brush-up instruction. See discussion under 3.2 below. As corrective action, the recruitment focus for brush-up classes was switched to BED where 64 employees (unduplicated count) participated in brush-up workshops.

1.2 Recruit 20 learning lab participants at BED.

At BED the Director of Human Resources, Instructor and Project Director developed and implemented an amplified set of process objectives:
A. Recruit participants from each Sector.
B. Recruit participants from the ongoing workshops.
C. Recruit participants from referrals by individual supervisors.
D. Recruit participants from referrals by the Employee Development Committee (EDC), Management Team and/or Human Resources.
E. Recruit participants who wish to prepare for college or earn a GED.

As a result of these activities eleven (11) learning lab participants were recruited at BED; however, an additional 64 BED employees participated in brush-up workshops. We are confident that every person at BED who could benefit from BEST knew about it and was encouraged to participate. Slippage (serving 9 less than planned) was due to two factors. First, the objective was set based on the number of the employees that BED records identified as not having a high school diploma; however many of these employees turned out to have GEDs. Second, a few of the employees who lacked basic literacy skills were not willing to attempt to acquire such skills no matter what the program did to make participation easy, confidential and geared to their needs.

1.3 During the holistic assessment interview each employee will be asked how she/he heard about the program and why he/she decided to participate and any concerns she/he has about participating will be discussed.

This information was collected and it informed our thinking about how to recruit more successfully. At GE, the project team analyzed this information (presented anonymously) to look for clues as to what circumstances were associated with project participation. Discussion of these questions was valuable in revealing learner's needs and fears, and in reducing employees anxiety sufficiently that they were willing to participate in class. At GE, 45 % of the participants responding felt "uncomfortable" or "very uncomfortable" about beginning the program. Only 13 % felt "uncomfortable" at the end of the program and no one felt "very uncomfortable." At BED all the learning lab participants felt "comfortable" or "very comfortable" at both the beginning and the end of the program. The difference is probably due to the fact that BED students had met the instructor and most likely attended a workshop with him before being interviewed and were to be tutored individually. At GE, all but a few employees began with small group classes and due to the large size of the plant had not met the instructor prior to the intake interview.

Objective #2: *Use a custom-designed holistic assessment instrument to evaluate each individual's starting level of literacy and develop individual yet common educational plans.*

The assessment instrument (in draft or final form) was used with each student. The assessment process contributed greatly to the educational quality of the BEST program. The project director or teacher spent an hour with each participant interviewing and assessing him/her with the instrument. Not only did the instrument capture the progress participants made, it provided an invaluable opportunity to build rapport with each potential participant and to explore both the participant's self-image as a reader and learner and the actual strengths and weaknesses of each participant as a reader.

2.1 A holistic assessment instrument featuring literacy tasks encountered at GE, will be designed and field tested during the pilot project. This assessment will be revised and ready to use by the fourth week of the project.

As there were only 3 participants in the pilot project (before the start of the grant, and before the grant award was announced), the assessment instrument was drafted and tested only to the point of showing that the approach was workable. The evaluator recommended (as noted in the evaluation plan) that the evaluation instrument be field tested and revised in cycles 1 & 2, and used for actual evaluation only for participants in cycle 3. The assessment instrument couples a structured interview with actual literacy tasks at GE. The assessment provides a choice between two levels of reading difficulty. The instrument is included as appendix A of the evaluator's report.

2.2 A holistic assessment instrument, modeled on the one for GE, will be developed for BED by the start of cycle 2.

A draft instrument in which the literacy tasks were ones encountered at BED was developed for the start of the program at BED. It was then field tested and revised, before being used to collect the evaluation data during cycle 3. The instrument is included as appendix B of the evaluator's report.

2.3 Fifty to sixty GE employees will be assessed during the first three weeks of each cycle. (For cycles 2 and 3, this number also includes employees needing to continue in the literacy program for more than one cycle who will be reassessed.)

Participants were assessed at the start of each cycle, or when the employee expressed an interest in or willingness to consider participating in the BEST program. As enrollment was low until the final six months of the project, and as it was evident early on that employees often considered the program for a long time before enrolling, an open enrollment policy was adopted. In cycle 1, 32 students were assessed (11 were not enrolled because they were able to read the GE materials without major difficulty. Six of these 11 enrolled in the brush-up classes when they began in January 1991.) In cycle 2, 15 continuing students were re-assessed and 20 new students were assessed. Thirty-three enrolled in cycle 2, and 2 enrolled in brush -up classes. In cycle 3, 29 continuing students were re-assessed and 14 new students were assessed. All 43 enrolled. All but one completed the cycle and completed the post assessment.

2.4 Twenty BED employees will be assessed during cycle 2.

A total of 11 participants were assessed and enrolled in intensive instruction at BED. However, 64 additional employees participated in workplace literacy workshops.

2.5 For each student enrolled in the program, an individual learning plan will be written on the basis of the learning needs and goals jointly explored by that student and instructor during the holistic assessment.

Individual learning plans were written for all students based on the assessment, which also included goal setting.

Objective #3: *Provide literacy services using the integrated instructor/Responsive Text learning method.*

Responsive Text was integrated with instructor facilitated learner-centered instruction. The GE instructor developed lesson plans to accompany the Responsive Text units at GE. An effort was made to develop Responsive Text materials which could be used by learners at a wide range of skill levels.

3.1 At GE eight 60 hour classes (3 hours per week at 20 weeks) will provide literacy services to 48 employees per cycle using a class size of 4 to 8. The size and composition of each class will take into account the individuals' learning plans, including the extent to which Responsive Text can be utilized for individualized instruction.

Class size ranged from 1 for nonreaders to 8 for advanced classes. Seven classes were offered in the first cycle and eight in the other two cycles. Classes were offered from 5 am to 5 pm covering three shifts and two sites. Employees were grouped by learning needs within the constraints of worksite and shift. Classes were taught for 3 hours per week for 20 weeks for 3 cycles and were taught for an additional 10 weeks during the extension.

3.2 Make Responsive Text available as a "Brush-Up Lab" to all GE skill class participants. Expect to serve an additional 150 employees.

The brush-up classes were to be taught by GE skills instructors using Responsive Text on the Macintosh computers as part of their skills classes. This proved to be problematic. Implementation of this objective was to begin with cycle 2, after several Responsive Text units had been developed and tested. First the GE skills instructors were volunteers from the shop floor who generally had no previous training in teaching or in computer use. Because of this only a few were initially willing to volunteer to include Responsive Text instruction in their classes. Four teachers volunteered. The project director trained them and assisted them in their first class and as problems arose. They taught 21 students.

However, shortly thereafter due to production deadlines, GE skills classes were suspended first for several months, and after that for the remainder of the year. At this point it became clear that we could not rely on the skills classes to provide Responsive Text Brush-Up. The BEST instructor taught one Brush-Up class on third shift (at 4 am) to four employees who had asked to enroll in BEST but needed only Brush-Up. Because of production pressures GE could not allow the Brush-Up class to be offered on company time. So we tried the last remaining possibility, the Project Director and the Training Coordinator each taught an after hours Brush-Up class. But, response was light–only 6 employees participated. Therefore, we decided not to pursue after-hour Responsive Text classes.

However, we had received a number of requests from employees with good reading skills for BEST to offer a brush-up math class. As GE already offered more advanced math classes such as shop math after hours, it was decided that the GE Training Coordinator and GE engineers would offer "Critical Thinking and Problem Solving with Math" (fractions, decimals, percents and measurement) as an after hours class. Twenty-four employees participated.

In addition, at BED's request Brush-Up workshops were developed and offered in response to needs identified by mangers and supervisors in all sectors. Topics ranged from "Writing Effective Job Bids" to "How to Read Complicated Nuts and Bolts Documents Without Going Nuts." Sixty-four employees (unduplicated count) were served by these workshops.

In sum, because GE skills classes on company time were curtailed, only 31 GE employees participated in Responsive Text Brush-Up workshops, but an additional 24 GE employees participated in Brush-Up math and 64 BED employees participated in Brush-Up workshops. Thus, a total of 119 employees participated in BEST Brush -Up workshops.

3.3 At BED, a 10 hour per week learning lab will provide literacy services to 20 employees. Average employee attendance will be 2 hours per week, with each individual's hours of attendance arranged according to his/her learning plan and work schedule.

As discussed under 1.2 above, only 11 BED employees participated in the learning lab. Each individual's hours of attendance were arranged according to his/her learning plan and work schedule. The instructor scheduled lab times at both the BED office and the McNeil Generating (electric) Station across town, and adjusted his schedule to match the times employees were most likely to be available. All the same, the rotating shifts at the power station and the work structure at BED made it difficult for employees to consistently attend two hours per week. This problem was discussed with the Human Resources Director who met with supervisors and stressed the importance of providing release time for BEST. In addition, the start up and recruitment phase at BED took 3 months, not 1 month as planned because it was necessary to present the detailed program plan to the Sector Managers and to the Employee Development Committee before publicity about the program and direct contacts with the employees could begin. Although we were scheduled to present to these committees in January, they delayed our presentations to February. As a result total employee contact hours were 658, not the 1,600 targeted. Intensive instruction was provided one to one, while workshops were provided to groups.

3.4 The Responsive Text developer will deliver the Responsive Text implementation of the GE Basic skills manual at the start of cycle 1; the Broach and Bench manuals by the start of cycle 2; and the Electric Generation manual by the start of cycle 3.

A revised detailed schedule was developed at the start of the project which provided for the Responsive Text materials to be delivered in priority order. Responsive Text materials were delivered according to this schedule.
was changed

Objective #4: *Employ videotaping to document all components of the demonstration project and to greatly enhance the project's formative and summative evaluations.*

This objective was eliminated in its entirety at the time of the grant award, because all video taping equipment and supplies were cut from the budget during budget negotiations.

Objective #5: *Monitor progress toward these goals and the accomplishments of the related objectives employing both internal and external summative and formative evaluation.*

5.1 Meet with the external evaluator at the beginning of the project to complete the design of the outcome-focused evaluation system and instruments.

The project staff and the partners met jointly with the external evaluator at the beginning of the project. The evaluator, in consultation with the project director, wrote an evaluation plan which was submitted to the program officer.

5.2 *Evaluator will conduct formative evaluations at the end of cycles 1 & 2 and a summative evaluation at the end of the project.*

The evaluator conducted formative evaluations at the end of cycles 1 & 2 and a summative evaluation at the end of the project. The summative evaluation is attached.

5.3 *The ABE Project Director and GE Manager of Organization Development (the partners) meet formally each month to monitor progress and resolve problems.*

The partners met bi-weekly, usually with the instructor and the Responsive Text Developer. As explained above, GE was represented by the training coordinator, not the Manager of Organization Development.

5.4 *The GE Manager of Organization Development will conduct a formal project review with supporting personnel to review all results against project objectives at the completion of each cycle.*

Due to the personnel changes at GE, described above, the Project Director provided a written project review at the end of the first cycle, and results were evaluated against project objectives on a continuing basis, and corrective action taken whenever needed and feasible.

2. Project Participants and Program Parameters
(adapted from National Workplace Literacy Program Information Form.)

Part 1: Program Parameters

Number of employees served (duplicated count)
Intensive Instruction

	Target	Actual
GE cycle 1	48	21
GE cycle 2	48	33
GE cycle 3	48	43
Extra cycle (final 3 months of extension.)	0	50
BED	20	11
Total	**164**	**158**
Brush-Up/Workshops		
GE	150	55
BED	0	64
Total	**150**	**119**
Total All Participants	**314**	**277**

Funding
Federal Funds Expended: $225,555.64
Match Required: $96,702
Matching Funds: $117,268

Dollar value of release time
GE: $71,134
BED $10,902

Other in kind
GE: $18,250
BED: $4,982
Apple Computer: $12,000

Number participating in program offered (unduplicated count):
Basic Skills 202
GED 11
ESL 5
Total participants (unduplicated count) 218

Total Contact Hours Provided:
GE Target 8,640 Actual 5,330
BED Target 1,600 Actual 658

Part 2: Participant Data

Mean Age:
GE: 43
BED: 40

Sex:	# of males:	# of females:
GE (instruction only):	39	44
BED:	59	16

Race/Ethnicity:
Asian: 4
White: 165

Limited English Proficient: 5

Outcomes:
GE (cycle 3 instruction only)

	Positive change	No change
a. Tested higher on basic skills	34	1
b. Improved communication skills	35	2
c. Increased productivity	24	13
d. Improved attendance at work	4	33*
e. Increased self-esteem	32	4

BED (instruction only)

	Positive change	No change
a. Tested higher on basic skills	7	2
b. Improved communication skills	9	2
c. Increased productivity	6	5
d. Improved attendance at work	1	10*
e. Increased self-esteem	7	4

*At both BED and GE most participants in the program had excellent attendance at work before BEST.

3. Dissemination Activities

Dissemination has been accomplished through a video, presentations, publications and this final report. These are listed and/or described below.

Video

Two short videos on BEST at GE were produced by GE. One is primarily for employee recruitment to the program and features employees, supervisors and top management speaking about the value of the program. The second was produced for dissemination purposes. It includes some of the same footage as the first, plus additional information on the need for workplace literacy programs and the BEST project design and implementation. This video has been shown to partners in workplace literacy projects in New York City and New Mexico, and to managers at a number of other GE plants. The BEST project has been recognized nationally by GE Aircraft Engines as a "best practices". It is available from Judy Lashof at The Rutland Adult Learning Center, VISR, 128 Merchants Row, Rm 205, Rutland, VT 05701, phone: 802-775-0617 or from Joyce Vachon, Training Coordinator, GE, 210 Columbian Ave., Rutland, VT 05701, phone: 802-773-9121.

Presentations

At the end of the project, a conference was organized for Vermont business leaders and adult educators to share the lesson's learned from the project. At least one employer, the Rutland Regional Medical Center, is now planning a workplace literacy project as a result of attending this conference.

In addition the BEST workplace literacy project and Responsive Text was presented at the following national/international conferences:

4th Annual International Adult Literacy and Technology Conference, St Paul, MN, July 1990

34th Annual Meeting of the Human Factors Society, Orlando FL, October, 1990

The American Public Power Association Meeting, Phoenix AZ, April, 1991

Comission on Adult Basic Education Conference, Hartford, CT, April, 1991

5th Annual International Adult Literacy and Technology Conference, Anaheim, CA, July 1991.

American Association for Adult and Continuing Education Conference, Montreal, Que., November 1991

The project was also presented at Vermont's annual conference for all ABE and related adult educators in October 1991.

Publications

Information on the BEST program, particularly the Responsive Text element has been published as follows. A star (*) before the item indicates that a copy is in the appendix.

*"GE Aircraft Engines and Burlington Electric in workplace project" in **Business Council for Effective Literacy Newsletter**. July 1991, pp. 12-13.

*"GE people doing their B.E.S.T." in **Mountain Views**. GE Aircraft Engines Rutland, VT. November, 1991, pp. 1-2.

*Hillinger, Michael L. "Responsive Text: A training environment for literacy and job skills" in **Proceedings of the Human Factor Society 34th Annual Meeting.** 1990, pp.XXX

Hillinger, Michael L. "Computer speech and responsive text: Hypermedia support for reading instruction" in **Reading and Writing: An Interdisciplinary Journal** 4:219-229, 1992.

*"Making workplace literacy work" in **Macintosh Resource Guide: Adult Literacy**, Apple Computer, Inc. 1991.
Available from Apple Computer, Inc. 20525 Mariani Ave., Cupertino, CA 95014. Phone # (408) 996-1010

Office of Technological Assessment. Adult Literacy Programs and Providers, in press Feb 93. (Citation)

"Responsive Text" in **Macintosh Solutions Toolkit: Adult Literacy Software Sampler CD**, 1992.
CD available from Apple Computer, Inc. 20525 Mariani Ave., Cupertino, CA 95014. Phone # (408) 996-1010

Vatcher, Steve "Getting back to basics" in **Mountain Views**. GE Aircraft Engines Rutland, VT. February, 1991.

Final Report

Finally, as requested by DOE copies of this report are being submitted to the Curriculum Coordination Center and the ERIC Clearinghouse on Adult, Career and Vocational Education. Copies are also being provided to other professionals and practitioners in the field who are particularly interested in our approach.

4. Evaluation Activities

The summative evaluation was conducted by Dr. Donald Leu of the University of Syracuse. His report is attached as appendix 1. The evaluation design was developed jointly by Dr. Leu and the Project Director with input from the project team at each site. In keeping with the philosophical approach of the entire project, we decided to stress validity over reliablity, by using workplace tasks and employee identified goals rather than standardized tests to measure literacy skills and the changes in these skills. Recognizing both that changes in reading behavior (i.e. spending more time reading) often preceed measurable changes in decoding and comprehension, and that workplace literacy is about what people are able to do at work, we measured changes in behavior and in beliefs (attitudes) as well as changes in skills. Furthermore, we examined changes in both literacy levels and workplace performance and gathered data on this from multiple sources.

Based on a portfolio assessment process involving data collected from employee participants, their supervisors and instructors for all employees who completed the final six month cycle of instruction, the external evaluator concluded that:

> "It is clear that the literacy levels of participants increased substantially as a result of their participation in this program, especially with respect to comprehension and composition of workplace materials. Four separate sources of data consistently confirm this pattern; instructors perceived these changes in their students, supervisors perceived these changes in their employees, participants perceived these changes in themselves, and measures of comprehension and composition used in this evaluation indicate on average significantly greater scores on post-tests.
>
> What is especially impressive about this data is that, on average, each constituency with a stake in the program's outcome perceived important gains to have been made in literacy performance. Gains seen in the classroom by instructors and participants were also translated into higher level performance on literacy tasks in the workplace where they were significant enough to be noticed by supervisors."

5. Changes in Key Personnel

There were no changes in the key personnel employed under this grant.

C. Recommendations to United States Department of Education

Our experience in this project leads us to make three recommendations to DOE.

1) Both the business partner and the project director should attend the initial and final project conference. This will provide an excellent opportunity for them to forge a strong partnership right from the beginning. In addition it will provide for informative exchanges and increased understanding between business, educators and the department which will increase the likelihood of project success and expand knowledge about the keys to success.

2) The turn around time between submitting the grant application and project start -up should be reduced to no more than six months (three months would be ideal). In practice, the delay between grant application and project start-up is commonly one year. In a year, changes which greatly impact and potentially undermine the project can easily occur. In our case, during the year between application and start -up, the business champion of the project was transferred to a different plant; the in -house training program to which our project design was closely tied was significantly altered; and a major down turn began in the aircraft industry. Had our project begun six months earlier, it would have been well established before confronting these problems so that their impact would have been reduced.

3) The project period should be three years, not eighteen months. The going will be slow at first because a) the educators must learn about the workplace and the employer(s) must learn about literacy to forge a strong partnership, and b) a program needs to demonstrate some successes before it will be fully embraced by employees, supervisors and management. Thus, at eighteen months a project is likely to have just begun producing the results of which it is capable. An additional eighteen months is likely to be twice as productive as the first eighteen months.

An Evaluation of the Workplace Literacy Projects at General Electric, Rutland and the Burlington Electric Department

Conducted for Vermont Adult Basic Education

by

Donald J. Leu, Ph.D
Syracuse University

March 23, 1992
Syracuse, New York

Abstract

This evaluation reports on the effects of the workplace literacy project at General Electric, Rutland (GE) and the Burlington Electric Department (BED). The evaluation considers the effects on the literacy levels of program participants at these sites, the effects of increases in literacy on employees' work performance, and the utility of Responsive Text (a software design using both multimedia and hypertext) as a tool for supporting the developing literacy needs of employees in workplace settings. A portfolio assessment process involving data collected from employee participants, their supervisors, and instructors sought to determine the effects of this program. By triangulating multiple data sources, consistent patterns were developed in the data. These patterns allow one to draw the following conclusions:

1. The program at GE and BED significantly increased the literacy levels of program participants.
2. The program at GE and BED resulted in important gains on a variety of work performance measures.
3. Responsive Text is a powerful tool for simultaneously developing literacy and improving work performance.

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Purpose

In 1990, a consortium including Vermont Adult Basic Education, General Electric at Rutland (GE), and the Burlington Electric Department (BED) was awarded a National Workplace Literacy Grant from the federal government. The purpose of this project was to increase the literacy and work performance levels of workers who were increasingly expected to read and write more complex material in their workplace. Central to this project was the use of job training manuals at the General Electric plant at Rutland which had been programmed into a multimedia environment and presented by computer using Responsive Text. Responsive Text was developed by Dr. Michael Hillinger of Sharon, Vermont to make technical documents more accessible to readers with limited literacy skills and to assist the development of literacy skills as these readers engaged in its use. In addition, employees at the Burlington Electric Department used Responsive Text materials to prepare for their Commercial Driver's License (CDL) examination. Finally, employees at both companies received tutorial lessons in literacy in small group and individual sessions. Lessons at General Electric included support in reading, writing, and the use of Responsive Text to study job training manuals. Lessons at the Burlington Electric Department focused on developing writing ability and the use of Responsive Text to study for the CDL exam.

This evaluation sought to address three main questions related to this project:

1. To what extent did the literacy levels of individuals increase as a result of their participation in the project, especially with respect to the comprehension and composition of workplace literacy materials?

2. To what extent did the increased levels of literacy result in improvement in employee work performance?

3. To what extent does Responsive Text provide an effective tool for supporting the developing literacy needs of employees in workplace settings?

Method

To provide both formative and summative evaluation information, portfolio assessment procedures were employed. A portfolio was developed for each participant which included a number of assessment instruments:

1. A Pre-participation Interview Form
2. A Pre-participation Reading Assessment
3. A Pre-participation Writing Sample
4. A Post-participation Interview Form
5. A Post-participation Reading Assessment
6. A Post-participation Writing Sample
7. A Teacher's Perception of Improvement Scale
8. An Employee/Participant Self-Evaluation Form
9. A Supervisor's Response Form
10. A Responsive Text Evaluation Form

Pre-Participation Interview Form

The pre-participation interview form consisted of 21 structured interview items. These items included information about a number of areas related to previous school and literacy experiences, expectations for work and the program, as well as reading and writing habits. This form was intended to provide useful information for instructors about participants' background experiences and current literacy practices. The pre-participation interview form may be seen on pages 1-6 of Appendix A (GE) and pages 1-6 of Appendix B (BED).

Pre-participation Reading Assessment

The pre-participation reading assessment included several components:

1. A warm up experience
2. A printed word list to assess decoding skills
3. A passage comprehension test to assess comprehension of work-related materials

The warm up experience provided an opportunity for participants to get acquainted with the assessment tasks in a comfortable environment. Students were asked to read the words from several workplace signs in context. No data were collected from this experience. The Warm Up may be seen on pages 7-8 of Appendix A (GE) and page 7 of Appendix B (BED).

The printed word list contained 37 words from the workplace at GE and 27 words or phrases from the workplace at BED. This instrument was used to evaluate participants' decoding ability. Students were asked to read each item aloud. One point was given for each

item read correctly. At GE the total possible score was 37. At BED the total possible score was 27. The printed word list instrument may be seen on page 8 of Appendix A (GE) and page 9 of Appendix B (BED).

There were two levels of material for the passage comprehension test. Level I contained easier material that Level II. Students were assigned to an appropriate level based on information the examiner observed during performance on the warm up and the printed word list. Level I of the passage comprehension test contained two parts: a narrative and an expository portion. For the narrative portion, students selected one of two available narratives to read. At both GE and BED the narratives included "An Accident that Changed My Life" and "Left-handed". At GE, the expository selection was "Rags", an informational piece for GE employees. At BED, the expository selection was "Coal", an informational piece for BED employees. After reading one of the narrative passages, students were asked five inferential-level comprehension questions. Participants received one point for each question answered correctly, one-half point for a partially correct response, and 0 points for an incorrect response. The same procedures were followed for the expository selection. A total of 10 points was possible on Level I of the passage comprehension test.

Level II of the passage comprehension test contained two expository selections from workplace materials. At GE, the selections included "Manufacturing a Jet Engine" and "Introduction to Hazardous Material". Ten inferential questions were developed for each passage. Participants received one point for each question answered correctly, one-half point for a partially correct response, and 0 points for an incorrect response. A total of 20 points were possible on Level II of the passage comprehension test for GE participants. At BED, the selections included "Burning Coal" and "Introduction to Educational Aid". Five inferential questions were developed for each passage. Participants received one point for each question answered correctly, one-half point for a partially correct response, and 0 points for an incorrect response. A total of 10 points were possible on Level II of the passage comprehension test for BED participants.

The pre-participation reading assessment instruments may be seen on pages 7-15 of Appendix A (GE) and pages 7-15 of Appendix B (BED).

Pre-participation Writing Sample

The pre-participation writing sample at GE called for students to write a descriptive paragraph explaining how to bid on a job change. Primary trait and holistic scoring procedures were used to evaluate each writing sample. From 0-2 points were possible on each of four traits: content, vocabulary, punctuation, and spelling. Thus, the total possible score for each sample

ranged from 0-8. The pre-participation writing sample task may be seen on page 16 of Appendix A (GE).

At BED, the pre-participation writing sample called for students to write a descriptive paragraph or essay about something important in their lives. Primary trait and holistic scoring procedures were used to evaluate each writing sample. From 0-2 points were possible on each of four traits: content, vocabulary, punctuation, and spelling. Thus, the total possible score for each sample ranged from 0-8.

Post-participation Interview Form

Following completion of the program, most participants completed the post-participation interview form. This contained a number of questions related to their developing literacy abilities and their participation in the program. The post-participation interview form may be seen on pages 17-22 of Appendix A (GE) and pages 17-22 of Appendix B (BED).

Post-participation Reading Assessment

Following completion of the program, most participants completed the post-participation reading assessment. This was identical to the pre-participation reading assessment and allowed a comparison to be made between pre- and post-participation reading achievement levels. Both decoding and passage comprehension scores were obtained as they were before participation in the program. The post-participation reading assessment instruments may be seen on pages 23-31 of Appendix A (GE) and pages 23-31 of Appendix B (BED).

Post-participation Writing Sample

Procedures for collecting and scoring the post-participation writing sample were identical to those for the pre-participation writing sample. This allowed for a comparison to be made between performance before and after participation in the program.

Teacher's Perception of Improvement Scale

In order to triangulate changes in literacy performance among participants, a Teacher's Perception of Improvement Scale was completed by each instructor on each participant in the program. Instructors were asked to assign a score from 0 (no improvement) to 9 (very great improvement) in ten different areas for each participant. The Teacher's Perception of Improvement Scale may be seen on page 33 of Appendix A (GE) and page 33 of Appendix B (BED).

Employee/Participant Self-Evaluation Form

In order to further triangulate changes in literacy and job performance among participants, an Employee/Participant Self-Evaluation Form was completed by each participant in the program. This asked participants to evaluate changes in their own literacy and job performance since beginning in the program. Items 1-4 focused on changes in literacy performance in the workplace. Items 5-12 focused on changes in job performance in the workplace. Participants rated changes in their literacy and job performance from greatly decreased (0) to greatly increased (4). The Employee/Participant Self-Evaluation Form may be seen on page 34 of Appendix A (GE) and page 34 of Appendix B (BED).

Supervisor's Response Form

To complete the triangulation of changes in literacy and job performance among participants, participants' supervisors were asked to complete a Supervisor's Response Form. This was identical to the Employee/Participant Self-Evaluation Form and permitted further documentation of changes in participants' literacy and job performance since beginning in the program. Supervisors rated changes in their employees' literacy and job performance from greatly decreased (0) to greatly increased (4). The Supervisor's Response Form may be seen on pages 35-37 of Appendix A (GE) and pages 35-37 of Appendix B (BED).

Responsive Text Evaluation Form

Finally, a Responsive Text Evaluation Form was completed by each participant after the program. This was used to determine the amount of use Responsive Text received during the program and the usefulness of Responsive Text to program participants. It was also used to determine those features of Responsive Text that participants found most helpful. The Responsive Text Evaluation Form may be see on pages 38-40 of Appendix A (GE) and pages 38-40 of Appendix B (BED).

Results

QUESTION 1: To what extent did the literacy levels of individuals increase as a result of their participation in the project, especially with respect to the comprehension and composition of workplace literacy materials?

In order to evaluate this first question, multiple sources of data were used to triangulate consistent patterns of changes. Information was gathered from the instructors, the supervisors, and the participants regarding their perceptions of changes that took place in literacy performance as a result of participation in the program. In addition, a pre-post comparison of mean scores on the reading and writing assessment measures was conducted to determine whether or not significant differences occurred as a result of program participation. The results from these four data sources are reported below.

Instructors' Perception of Improvement in Literacy Performance

Items 1-10 of the Teacher's Perception of Improvement Scale permit an analysis of how the instructors in this program perceived changes in participants' literacy performance in a number of areas:

1. Comprehension of expository, workplace materials
2. Comprehension of narrative materials
3. Decoding ability
4. Vocabulary knowledge
5. Interest in reading
6. Interest in writing
7. Participation in group activities
8. Ability to use Responsive Text
9. Interest in using Responsive Text
10. Writing ability

Instructors rated each participant in each area on a scale ranging from 0 (no improvement) to 9 (very great improvement). Mean scores were then calculated in each of the ten areas for participants at General Electric and at the Burlington Electric Department. The mean scores for each location are presented in Table 1. Graphs of these scores are presented in Figure 1 (GE) and Figure 2 (BED).

Table 1 and Figures 1-2 indicate that Instructors at both GE and BED perceived participants, on average, to make gains in various areas of literacy performance ranging from

moderate to great. At GE, greater gains appeared in the comprehension of narrative material (M = 6.89) while at BED greater gains appeared in interest in writing (M = 6.89) and writing ability (M = 6.78). At both locations, substantial gains were reported in participants' ability to use responsive text (M_{ge} = 6.55, M_{bed} = 6.50)

Table 1. Mean Scores for Items on the Teacher's Perception of Improvement Scale at GE and BED

Area	GE	BED
Comp. of expository, workplace materials	5.41	5.56
Comprehension of narrative materials	6.89	5.33
Decoding ability	6.08	5.56
Vocabulary knowledge	6.41	5.61
Interest in reading	6.08	5.78
Interest in writing	5.95	6.89
Participation in group activities	5.86	5.33
Ability to use responsive text	6.55	6.50
Interest in using responsive text	6.21	6.28
Writing ability	5.38	6.78

Figure 1.

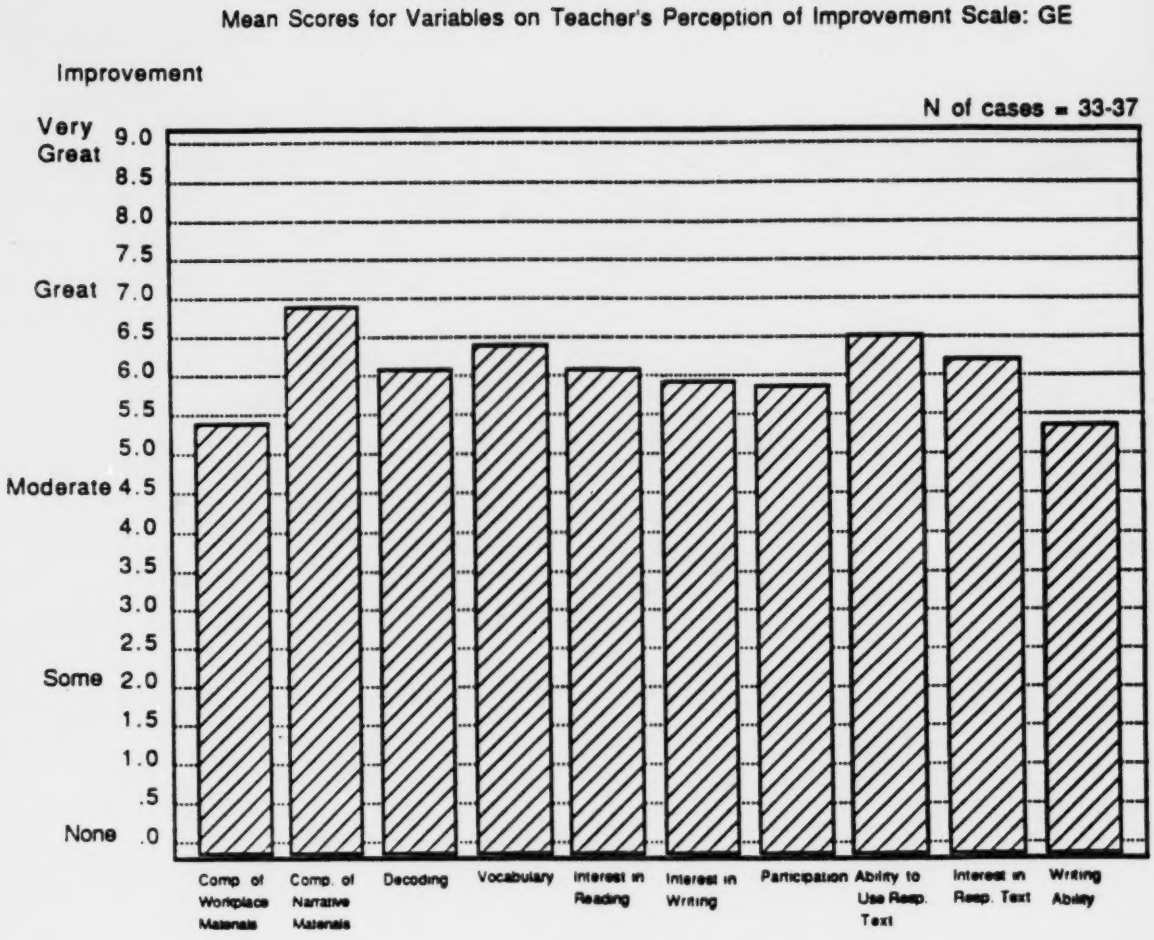
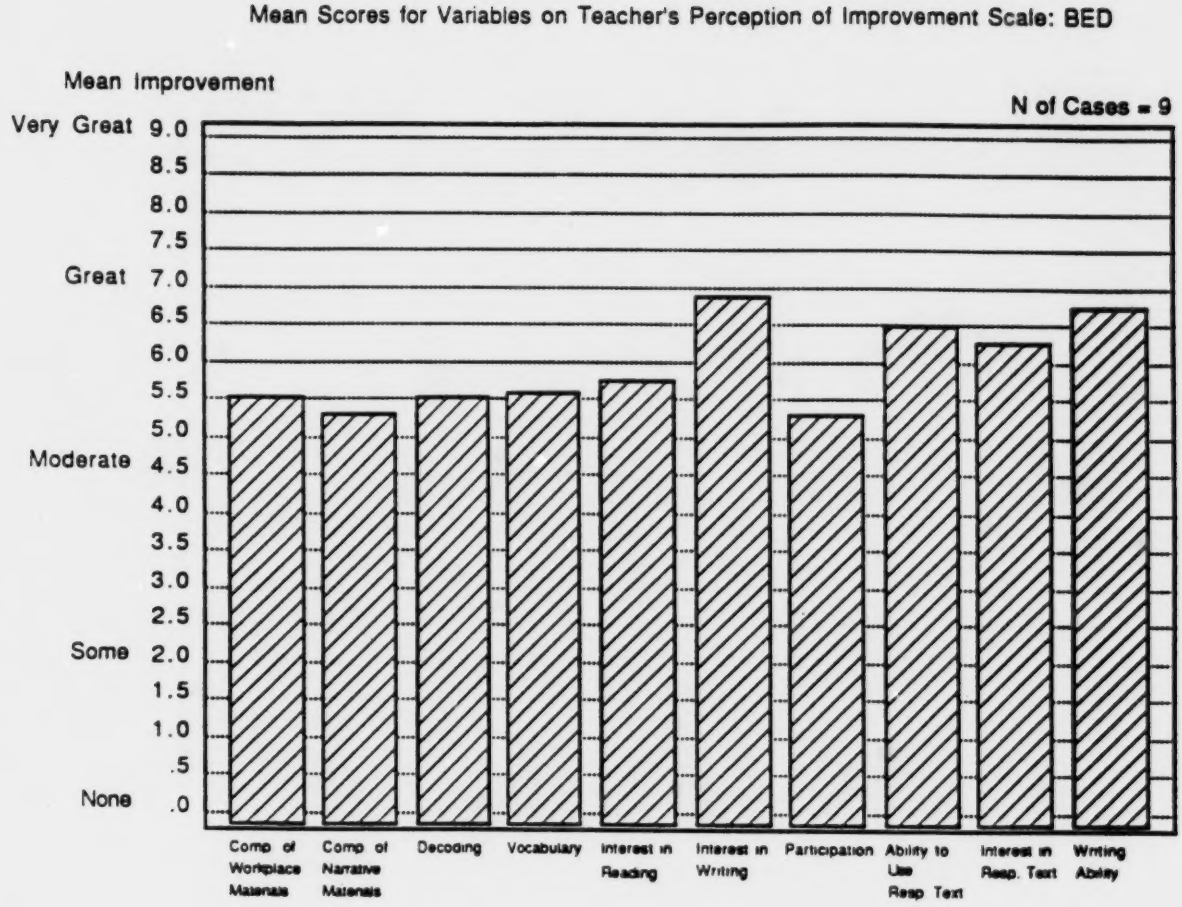

Mean Scores for Variables on Teacher's Perception of Improvement Scale: GE
Improvement
N of cases = 33-37
Very Great
9.0
8.5
8.0
7.5
Great
7.0
6.5
6.0
5.5
5.0
Moderate
4.5
4.0
3.5
3.0
2.5
Some
2.0
1.5
1.0
.5
None
.0
Comp. of Workplace Materials
Comp. of Narrative Materials
Decoding
Vocabulary
Interest in Reading
Interest in Writing
Participation
Ability to Use Resp. Text
Interest in Resp. Text
Writing Ability

Figure 2.


Mean Scores for Variables on Teacher's Perception of Improvement Scale: BED
Mean Improvement
N of Cases = 9
Very Great
Great
Moderate
Some
None
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
.5
.0
Comp of Workplace Materials
Comp of Narrative Materials
Decoding
Vocabulary
Interest in Reading
Interest in Writing
Participation
Ability to Use Resp Text
Interest in Resp. Text
Writing Ability

Supervisors' Perception of Employees' Improvement in Literacy Performance

Items 1-4 in Part II of the Supervisor's Response Form permit an analysis of how the supervisors in this program perceived changes in participants' literacy performance in four areas:

1. Changes in the employee's ability to read job-related materials
2. Changes in the employee's ability to write job-related material
3. Changes in the frequency the employee reads in the workplace
4. Changes in the frequency the employee writes in the workplace

Supervisors rated each participant in each area on a scale ranging from 0 (greatly decreased) to 5 (greatly increased). Mean scores were calculated in each of the four areas for participants at General Electric and at the Burlington Electric Department. The mean scores for each location are presented in Table 2. Graphs of these scores are presented in Figure 3 (GE) and Figure 4 (BED).

Table 2 and Figures 3-4 indicate that supervisors at both GE and BED perceived participants, on average, to make gains in each of these four areas of literacy performance. At GE, greater perceived gains appeared in the employees' ability to read job-related material (M = 3.03) while at BED greater perceived gains appeared in employees' ability to write job-related material (M = 3.10).

Table 2. Mean Scores for Items on the Supervisor's Response Form

	GE	BED
Employee's ability to read job-related material	3.03	2.60
Employee's ability to write job-related material	2.92	3.10
The frequency the employee reads in the workplace	2.74	2.55
The frequency the employee writes in the workplace	2.64	2.73

Figure 3.

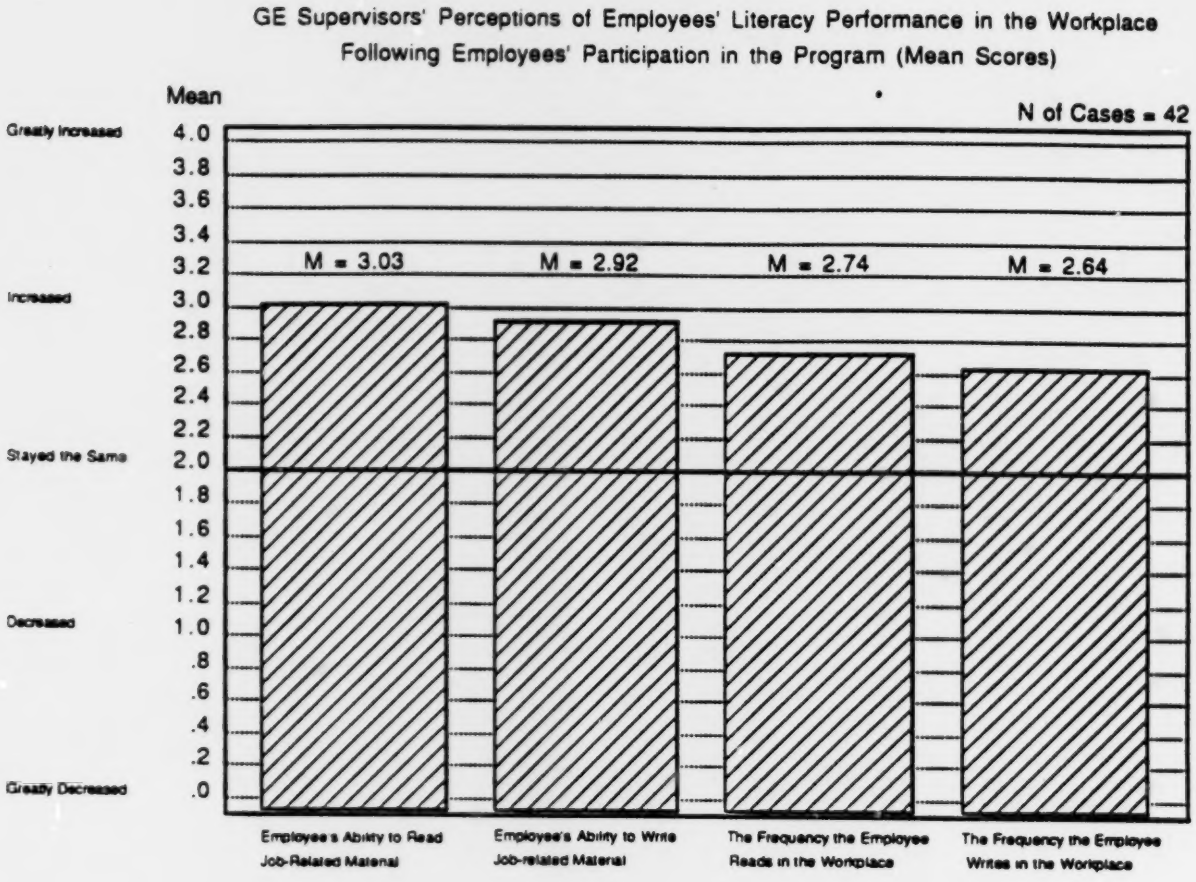
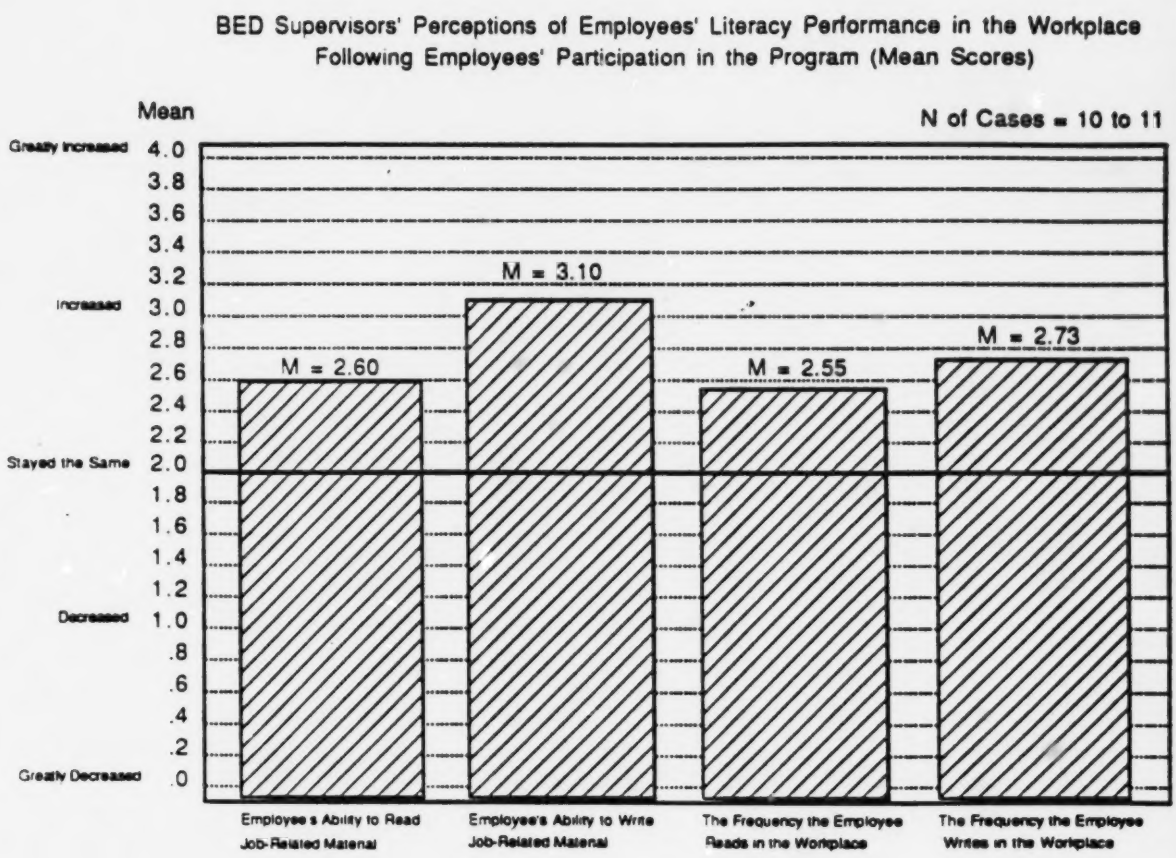

GE Supervisors' Perceptions of Employees' Literacy Performance in the Workplace
Following Employees' Participation in the Program (Mean Scores)
Mean
N of Cases = 42
Greatly Increased
Increased
Stayed the Same
Decreased
Greatly Decreased
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
.0
M = 3.03
M = 2.92
M = 2.74
M = 2.64
Employee's Ability to Read Job-Related Material
Employee's Ability to Write Job-related Material
The Frequency the Employee Reads in the Workplace
The Frequency the Employee Writes in the Workplace

Figure 4.


BED Supervisors' Perceptions of Employees' Literacy Performance in the Workplace
Following Employees' Participation in the Program (Mean Scores)
Mean
N of Cases = 10 to 11
Greatly Increased
Increased
Stayed the Same
Decreased
Greatly Decreased
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
.0
M = 2.60
M = 3.10
M = 2.55
M = 2.73
Employee's Ability to Read Job-Related Material
Employee's Ability to Write Job-Related Material
The Frequency the Employee Reads in the Workplace
The Frequency the Employee Writes in the Workplace

Participants' Perception of Their Own Improvement in Literacy Performance

Items 1-4 of the Employee/Participant Self-Evaluation Form permit an analysis of how the participants in this program perceived changes in their own literacy performance in the same four areas as on the Supervisor's Response Form:

1. Changes in the participant's ability to read job-related materials
2. Changes in the participant's ability to write job-related material
3. Changes in the frequency the participant reads in the workplace
4. Changes in the frequency the participant writes in the workplace

This also allows for triangulation, comparisons to be made with the perceptions of supervisors as well as instructors. Participants rated themselves in each area on a scale ranging from 0 (greatly decreased) to 5 (greatly increased). Mean scores were calculated in each of the four areas for participants at General Electric and at the Burlington Electric Department. The mean scores for each location are presented in Table 3. Graphs of these scores are presented in Figure 5 (GE) and Figure 6(BED).

Table 3 and Figures 5-6 indicate that program participants at both GE and BED perceived themselves, on average, to make gains in each of these four areas of literacy performance. At GE, greater perceived gains appeared in the employees' ability to read job-related material (M = 2.91) while at BED greater perceived gains appeared in employees' ability to write job-related material (M = 3.25).

Table 3. Mean Scores for Items on the Employee/Participant Self-Evaluation Form

	GE	BED
Participant's ability to read job-related material	2.91	2.67
Participant's ability to write job-related material	2.81	3.25
The frequency the participant reads in the workplace	2.76	2.67
The frequency the participant writes in the workplace	2.48	3.00

Figure 5.

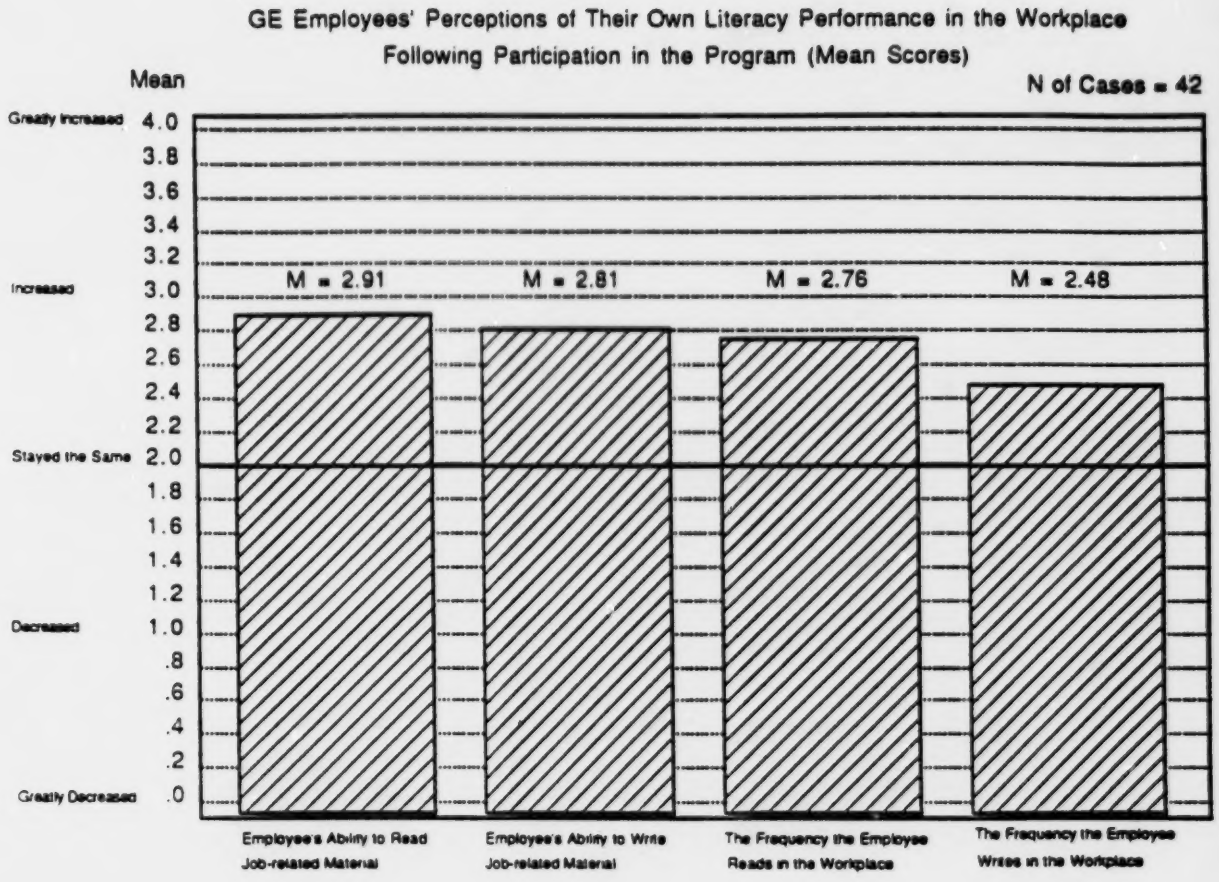
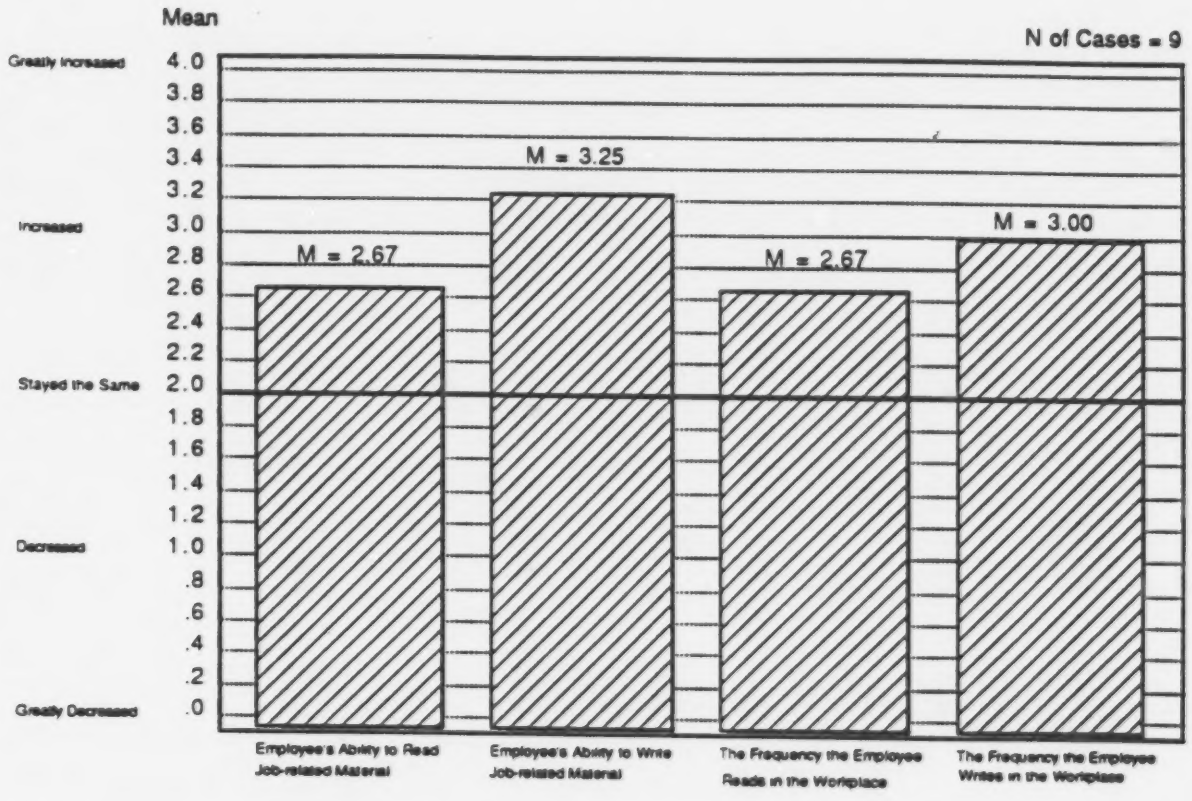

GE Employees' Perceptions of Their Own Literacy Performance in the Workplace
Following Participation in the Program (Mean Scores)
Mean
N of Cases = 42
Greatly Increased
Increased
Stayed the Same
Decreased
Greatly Decreased
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
.0
M = 2.91
M = 2.81
M = 2.76
M = 2.48
Employee's Ability to Read Job-related Material
Employee's Ability to Write Job-related Material
The Frequency the Employee Reads in the Workplace
The Frequency the Employee Writes in the Workplace

Figure 6.

BED Employees' Perceptions of Their Own Literacy Performance in the Workplace Following Participation in the Program (Mean Scores)



Comparison of Pre- and Post-participation Reading and Writing Assessment Measures

A final method used to evaluate whether or not literacy levels of individuals increased as a result of their participation in the project consisted of a comparison of mean scores by participants on the pre- and post-participation reading and writing assessment measures. Four measures were included in this portion of the assessment:

1. Decoding
2. Level I Passage Comprehension
3. Level II Passage Comprehension
4. Writing Sample

The decoding score was obtained by counting the number of words read correctly on the printed word list. The printed word list contained 37 words from the workplace at GE and 27 words or phrases from the workplace at BED. At GE the total possible score was 37. At BED the total possible score was 27. The score on Level I of the passage comprehension task was obtained by counting the number of inferential-level questions answered correctly after reading one narrative and one expository and work-related passage. A total of 10 points was possible on Level I of the passage comprehension test at both GE and BED. The score on Level II of the passage comprehension task was obtained by counting the number of inferential-level questions answered correctly after reading two expository and work-related passages. A total of 20 points was possible on Level II of the passage comprehension test at GE while a total of 10 points was possible at BED. The scores on the writing samples were obtained using primary trait and holistic scoring procedures. From 0-2 points were possible on each of four traits: content, vocabulary, punctuation, and spelling. Thus, the total possible score for each sample ranged from 0-8. The mean scores for each of these measures are presented in Table 4. Graphs of these scores are presented in Figure 7 (GE) and Figure 8 (BED).

Table 4 and Figures 7-8 indicate that mean scores on each of the four measures of literacy performance increased at both GE and BED from pre to post-assessment period. In each case but two, these mean differences were statistically significant ($p < .05$). At GE, comparison of pre-post means on decoding ($t = 3.27$, $df=20$, $p = .004$), Level I passage comprehension ($t = 2.78$, $df=13$, $p = .02$), Level II passage comprehension ($t = 4.86$, $df=19$, $p = .0001$), and total writing sample score ($t = 2.95$, $df=35$, $p = .006$) each demonstrated a statistically significant increase from pre-test to post-test score. At BED statistically significant differences appeared between pre-post means for Level II passage comprehension ($t = 2.29$, $df=9$, $p = .048$), and total writing sample score ($t = 2.31$, $df=8$, $p = .0497$). Significant differences were not found between pre-post test means for decoding scores ($t = 0.0$, $df=6$, $p = 1.00$) and Level I passage comprehension scores at BED. The former was due to a ceiling effect since all participants at BED achieved the

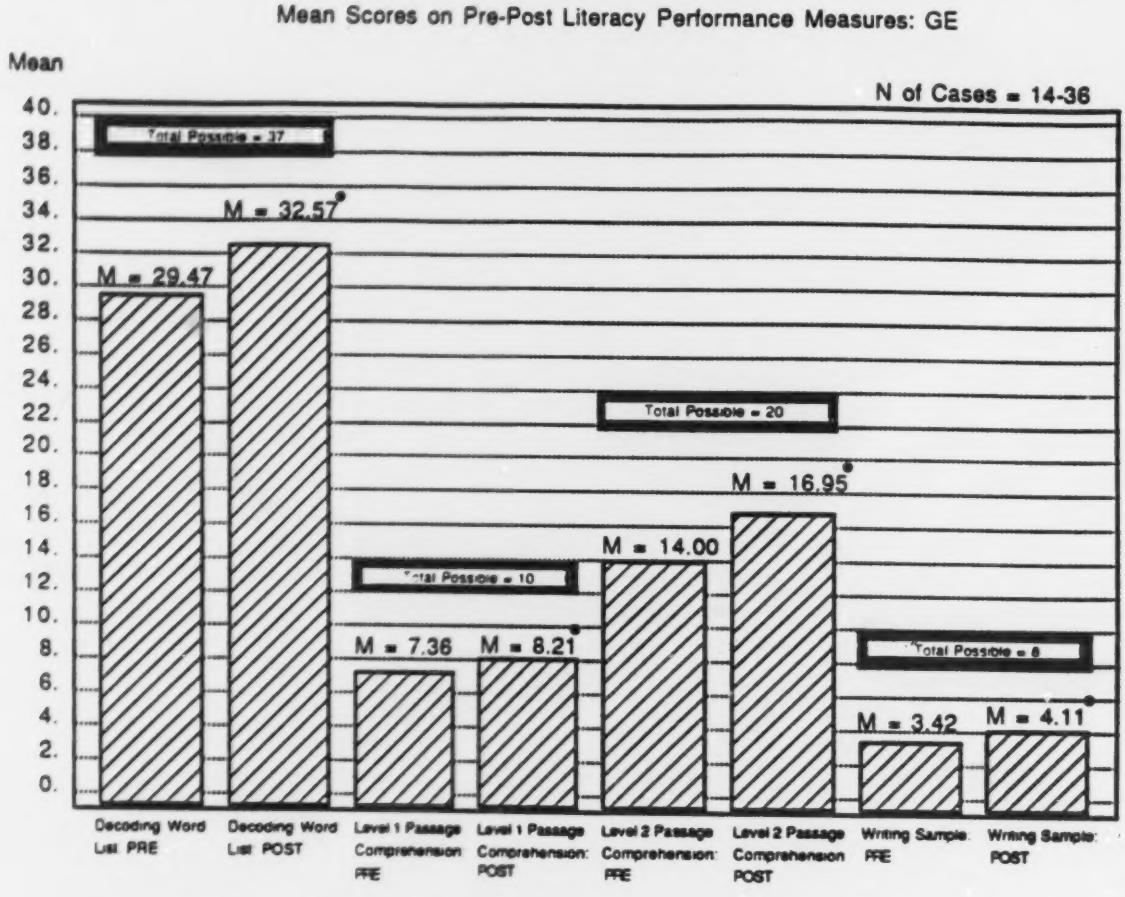
maximum score on both pre- and post-test assessments. The later may have been due to the small number of participants (9) who took both the pre- and the post-test at BED.

Table 3. Mean Scores for Pre-Post Literacy Performance Measures

	CE		BED	
	Pre-test	Post-test	Pre-test	Post-test
Decoding Word List	29.47	32.57*	27.00	27.00
Level I Passage Comprehension	7.36	8.21*	9.20	9.80
Level II Passage Comprehension	14.00	16.95*	8.30	9.05*
Writing Sample	3.42	4.11*	4.78	5.70*

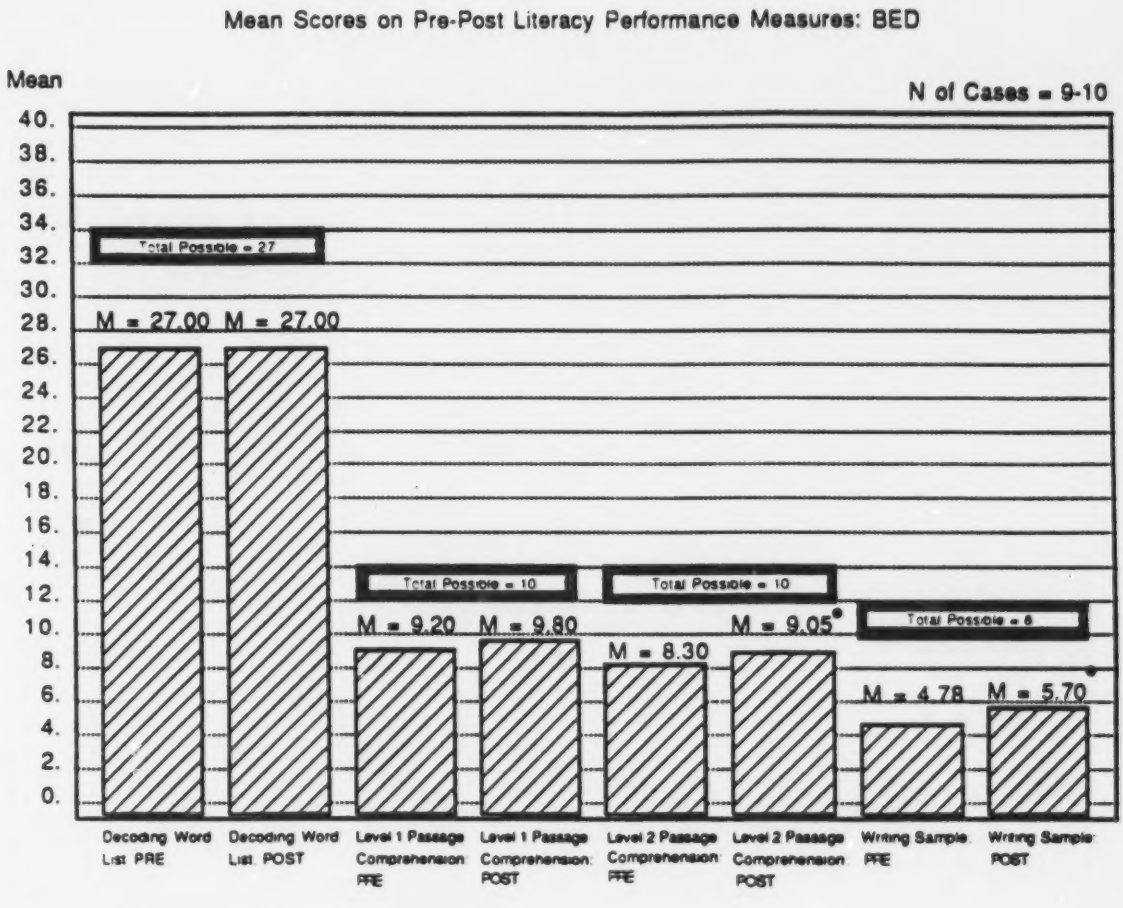
* Significantly greater than pre-test mean ($p < .05$)

Figure 7.



* Significantly greater ($p < .05$) than mean pre-test score.

Figure 8.


Mean Scores on Pre-Post Literacy Performance Measures: BED
Mean
N of Cases = 9-10
40.
38.
36.
34.
32.
30.
28.
26.
24.
22.
20.
18.
16.
14.
12.
10.
8.
6.
4.
2.
0.
Total Possible = 27
M = 27.00
M = 27.00
Total Possible = 10
M = 9.20
M = 9.80
Total Possible = 10
M = 8.30
M = 9.05*
Total Possible = 6
M = 4.78
M = 5.70*
Decoding Word List PRE
Decoding Word List POST
Level 1 Passage Comprehension PRE
Level 1 Passage Comprehension POST
Level 2 Passage Comprehension PRE
Level 2 Passage Comprehension POST
Writing Sample PRE
Writing Sample POST
* Significantly greater (p< 05) than mean pre-test score

QUESTION 2: To what extent did the increased levels of literacy result in improvement in employee work performance?

In order to evaluate this second question, multiple sources of data were again used to triangulate consistent patterns of changes. Information on changes in workplace performance was gathered from both the participants and the participants' supervisors. The results from these data sources are reported below.

Participants' Perception of Changes in Their Work Performance

Items 5-12 of the Employee/Participant Self-evaluation Form permit an analysis of how the participants perceived changes in their work performance that took place after they began the program. Participants rated changes in their work performance from greatly decreased (0) to greatly increased (4). Items on this instruments asked participants to evaluate changes in seven areas of work performance:

1. Leadership in the workplace
2. Initiative in the workplace
3. Knowledge of his/her job
4. Self-confidence in the workplace
5. Absenteeism
6. Quality of work
7. Level of responsibility

Mean scores for participants at both GE and BED were calculated in order to evaluate participants' perceptions of changes that took place in their work performance. The mean scores for each location are presented in Table 5. Graphs of these scores are presented in Figure 9 (GE) and Figure 10 (BED).

Table 5 and Figures 9-10 indicate that participants at both GE and BED perceived important changes to have occurred in their work performance following participation in the program. At GE, greater gains appeared in participants' self-confidence (M = 3.13), knowledge of the job (2.90), and level of responsibility (2.92). Gains appeared in all areas except for absenteeism which participants reported, on average, to have remained the same. At BED, greater gains appeared in participants' self-confidence (M = 2.90), initiative (M = 2.78) and knowledge of the job (M = 2.78). Again, gains appeared in all areas except for absenteeism which participants reported, on average, to have remained about the same. It is also important

to note that participants at both locations perceived both the quality and the quantity of their work to have increased following participation in the program.

Table 5. Mean Scores for Items on the Employee/Participant Self-evaluation Form at GE and BED

Area	GE	BED
Leadership in the workplace	2.56	2.56
Initiative in the workplace	2.67	2.78
Knowledge of his/her job	2.90	2.78
Self-confidence in the workplace	3.13	2.90
Absenteeism	2.00	2.10
Quality of work	2.55	2.70
Quantity of work	2.42	2.50
Level of responsibility	2.94	----

Figure 9.

GE Participants' Perception of Performance in the Workplace
Following Participation in the Program

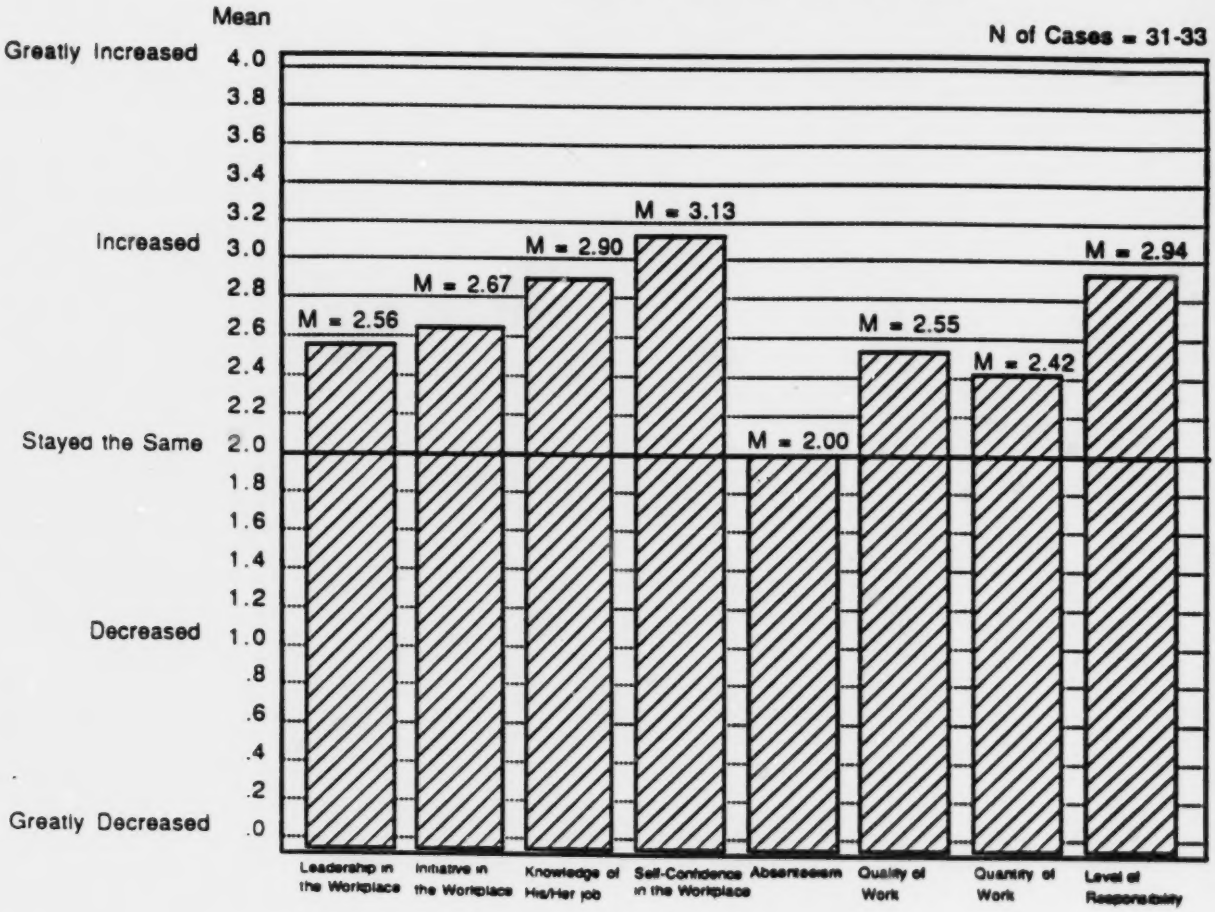
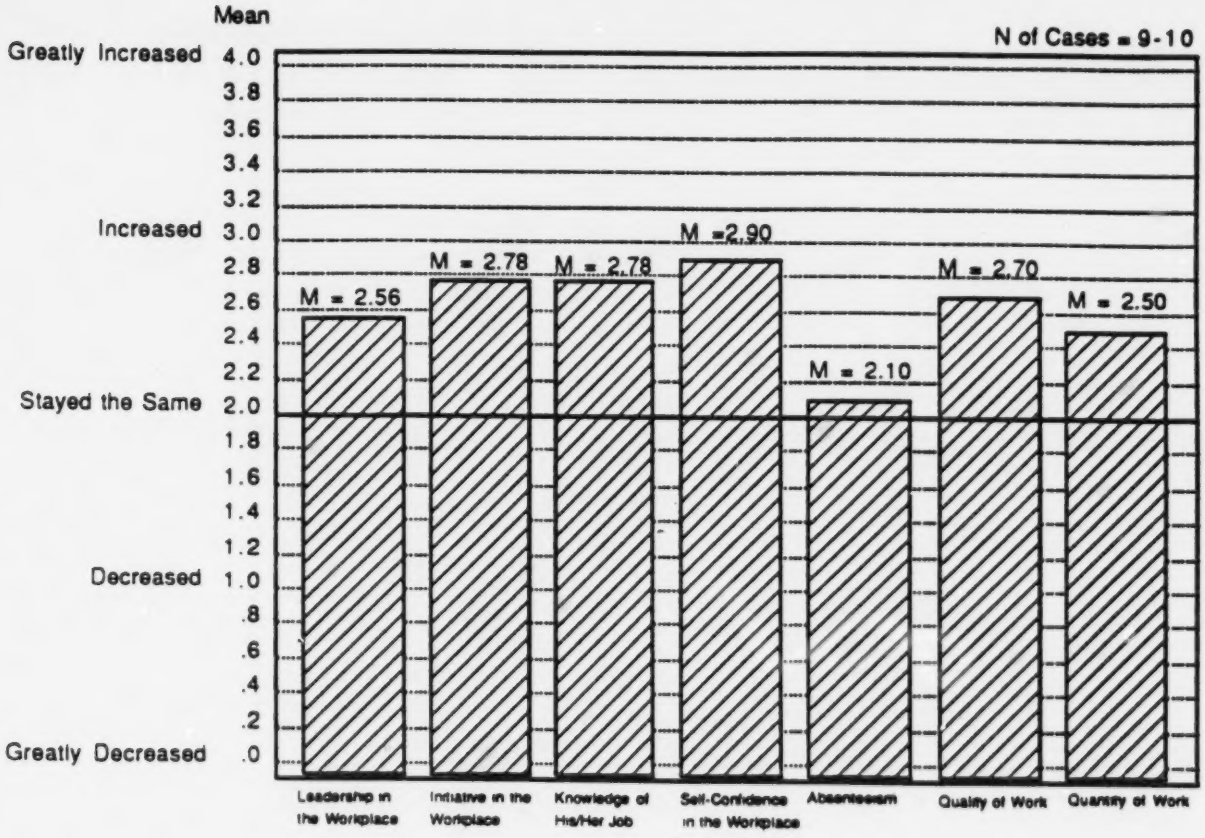


Figure 10.

BED Participants' Perception of Performance in the Workplace
Following Participation in the Program



Supervisors' Perception of Changes in Their Employees' Work Performance

Items 5-12 of the Supervisor's Response Form permit an analysis of how supervisors perceived changes in their employees' work performance that parallels the analysis of participants' perceptions. Supervisors' rated changes in their employees' work performance from greatly decreased (0) to greatly increased (4). As with the earlier analysis of participants' perceptions, items on this instruments asked supervisors to evaluate changes in seven areas of work performance:

1. Leadership in the workplace
2. Initiative in the workplace
3. Knowledge of his/her job
4. Self-confidence in the workplace
5. Absenteeism
6. Quality of work
7. Level of responsibility

Supervisors' mean scores for participants at both GE and BED were calculated in order to evaluate supervisors' perceptions of changes that took place in their employees' work performance. The mean scores for each area are presented in Table 6. Graphs of these scores are presented in Figure 11 (GE) and Figure 12 (BED).

Table 6 and Figures 11-12 indicate that supervisors at both GE and BED perceived important changes to have occurred in their employees' work performance following participation in the program. This parallels and confirms the earlier analysis of perceptions by participants in the changes in their work performance. At GE, supervisors perceived greater gains in participants' self-confidence in the workplace (M = 3.36), initiative in the workplace (3.05), and knowledge of the job (2.92). Gains appeared in all areas except for absenteeism which supervisors reported, on average, to have slightly decreased, perhaps due to the fact that participation in the program occurred during release time. At BED, supervisors perceived greater gains in participants self-confidence in the workplace (M = 2.82), knowledge of the job (M = 2.82), and initiative in the workplace (M = 2.73). Again, gains appeared in all areas except for absenteeism which participants reported, on average, to have remained the same. It is important to note that supervisors at both locations perceived both the quality and the quantity of their employees' work to have increased following participation in the program.

Table 6. Mean Scores for Items on the Supervisor's Response Form at GE and BED

Area	GE	BED
Leadership in the workplace	2.78	2.55
Initiative in the workplace	3.05	2.73
Knowledge of his/her job	3.00	2.82
Self-confidence in the workplace	3.36	2.82
Absenteeism	1.87	2.00
Quality of work	2.70	2.55
Quantity of work	2.65	2.55
Level of responsibility	2.78	----

A decrease in absenteeism is a positive change.

Absenteeism was not a significant problem at either worksite prior to the BEST program - so not much room for improvement!

Figure 11.

GE Supervisors' Perceptions of Employees' Performance in the Workplace
Following Participation in the Program

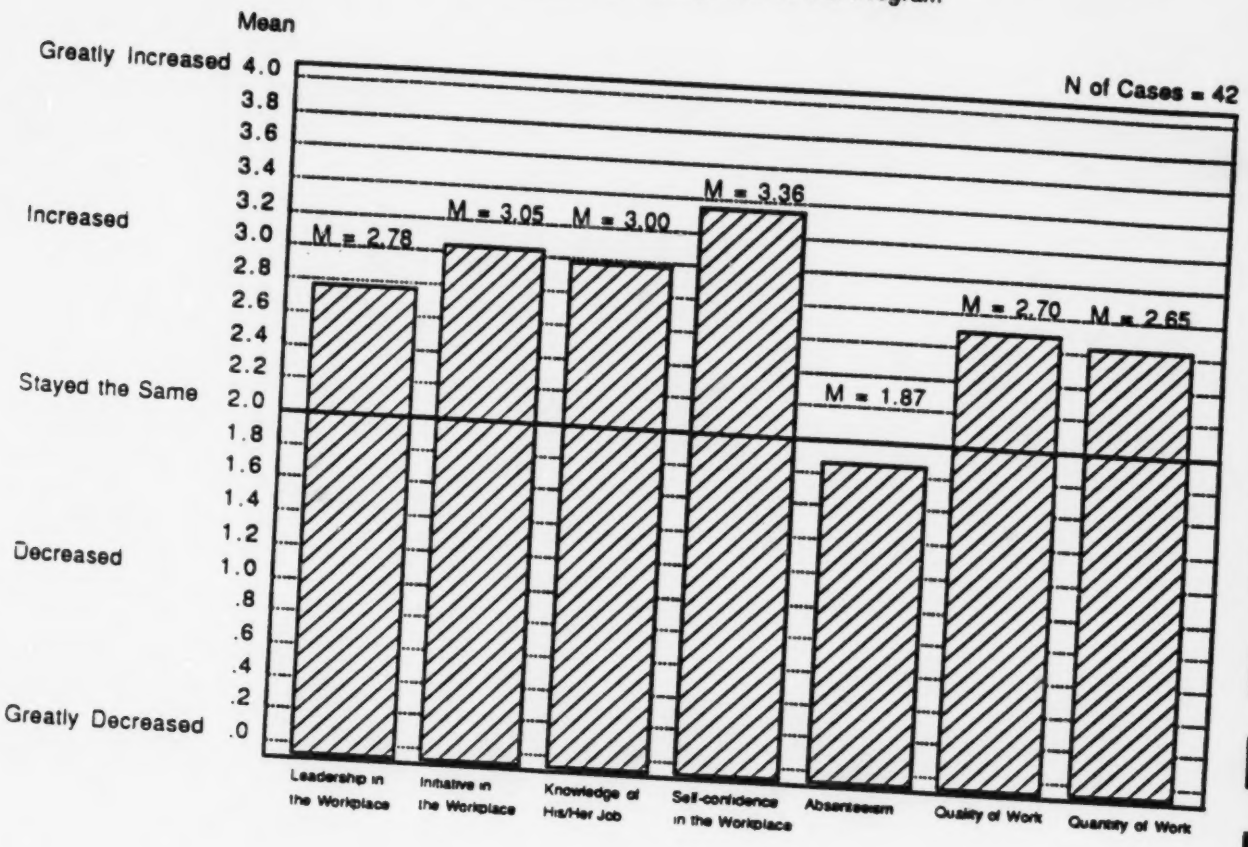
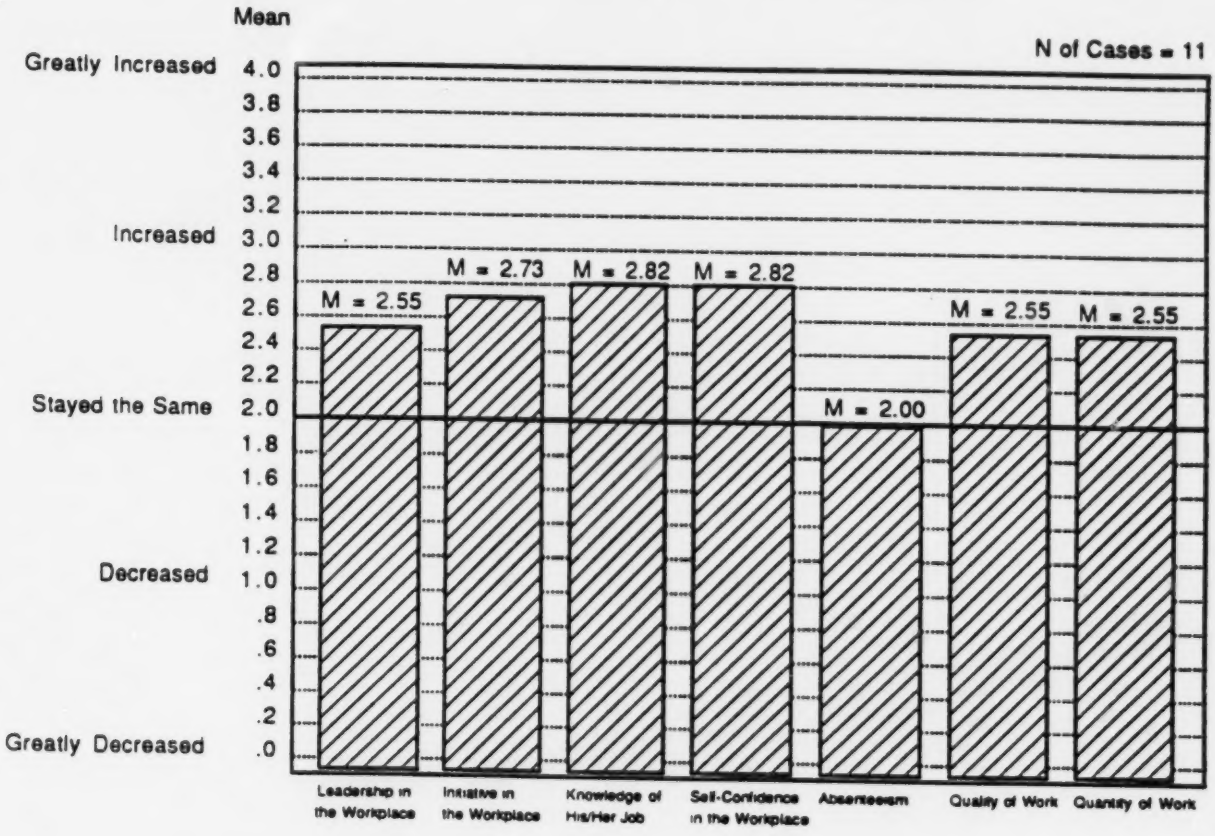


Figure 12.

BED Supervisors' Perceptions of Employees' Performance in the Workplace
Following Participation in the Program



QUESTION 3: To what extent does Responsive Text provide an effective tool for supporting the developing literacy needs of employees in workplace settings?

In order to evaluate this third question, several sources of information were used from the Responsive Text Evaluation Form, completed by program participants. Two areas of participants' interactions with Responsive Text were evaluated: the perceived usefulness of Responsive Text for literacy and literacy learning tasks and the degree to which various design elements of Responsive Text were helpful to participants as they read complex technical documents.

Participants' Perception of the Usefulness of Responsive Text

Responses to items 1-4 on part two of the Responsive Text Evaluation Form were used to determine the usefulness of responsive text in several areas:

1. for developing reading skills
2. for developing writing skills
3. for helping to understand technical documents at work
4. for learning about new things at work.

Program participants evaluated the usefulness of each area on a scale ranging from 0 (not useful) to 3 (very useful). Mean scores for participants at both GE and BED were calculated in order to evaluate their perceptions of the usefulness of Responsive Text for various functions. The mean scores for each function are presented in Table 6. Graphs of these scores are presented in Figure 11 (GE) and Figure 12 (BED).

Table 7 and Figures 13-14 indicate that participants at both GE and BED perceived Responsive Text to be useful for each function evaluated: for developing reading skills, for developing writing skills, for understanding technical documents at work, and for learning about new things at work. At GE, Responsive Text was viewed as especially useful for developing reading skills (M = 2.00) and for learning about new things at work (M = 1.93). At BED, Responsive Text was also viewed as especially useful for developing reading skills (M = 2.00) and for learning about new things at work (M = 2.00).

Table 7. Mean Scores by Program Participants for the Usefulness of Responsive Text for Several Functions

Area	GE	BED
For developing reading skills	2.00	2.00
For developing writing skills	1.37	1.75
For helping to understand technical documents at work	1.86	1.80
For learning about new things at work	1.93	2.00

Figure 13.

How GE Participants Viewed the Usefulness of Responsive Text for Various Functions

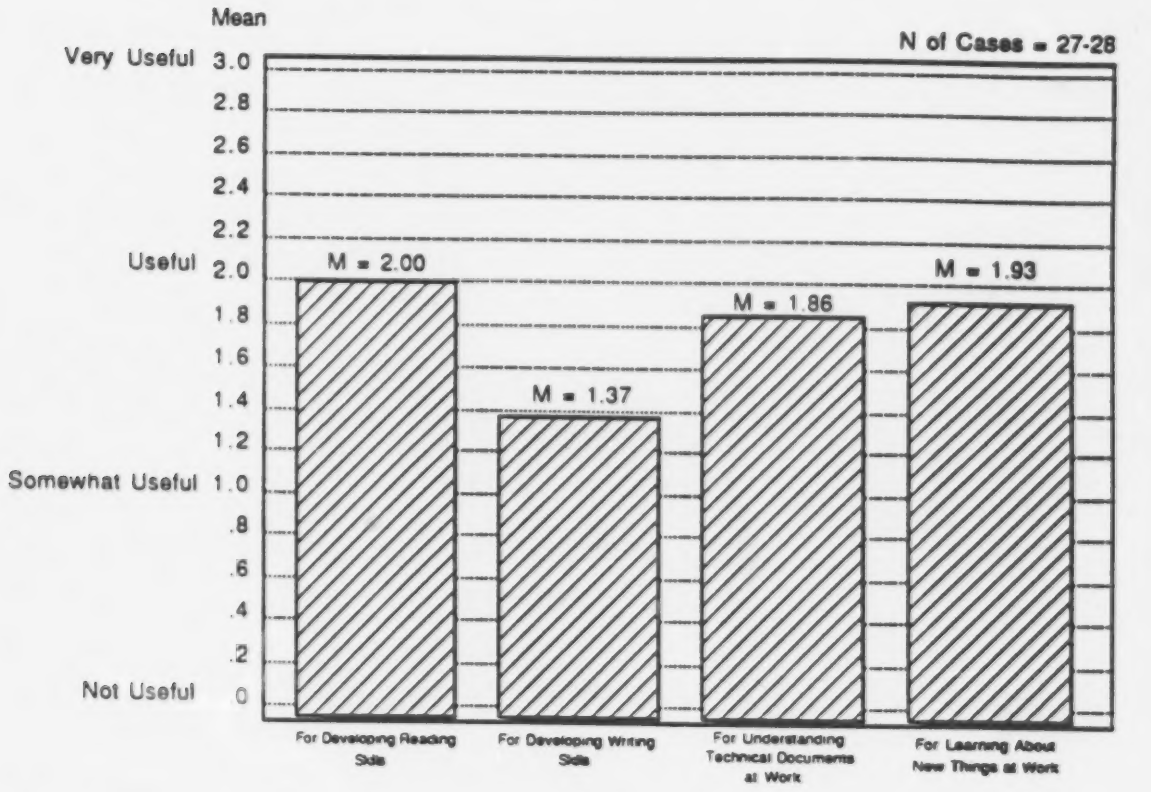
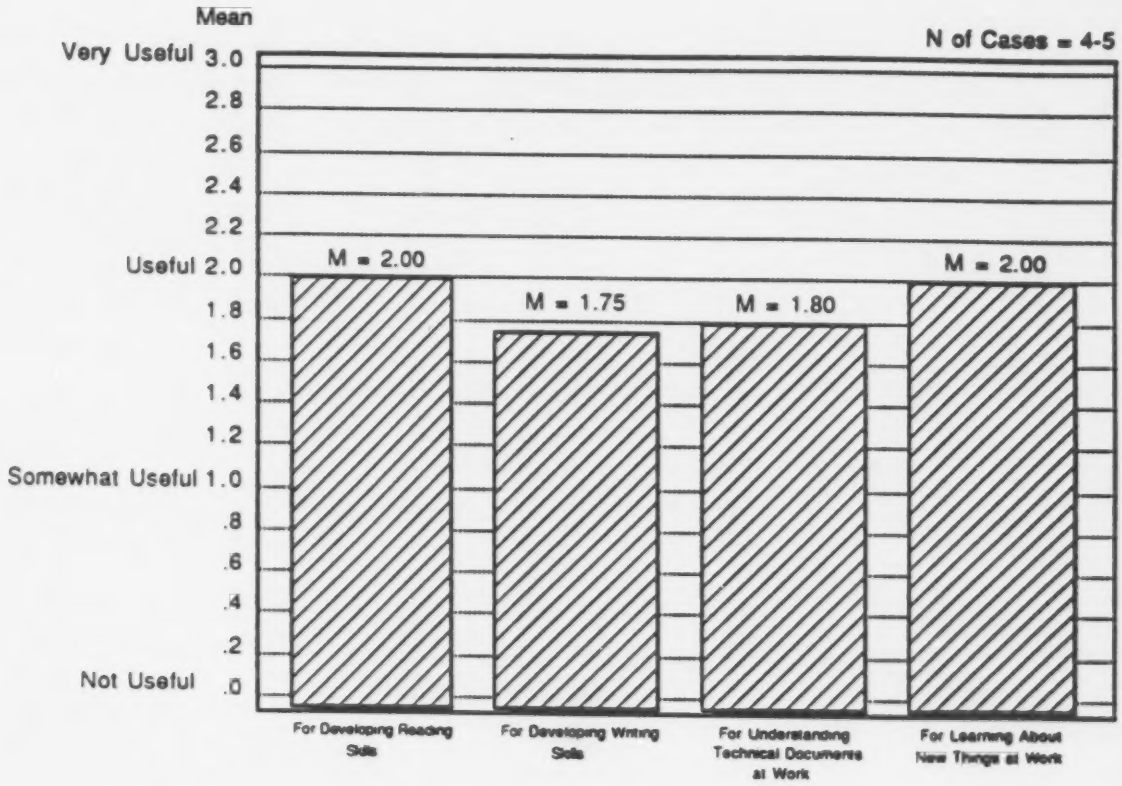


Figure 14.

How BED Participants Viewed the Usefulness of Responsive Text for Various Functions



Participants' Perception of the Extent to which Various Features of Responsive Text Were Helpful to Them

Responses to items 1-4 on part two of the Responsive Text Evaluation Form were used to determine the extent to which various design elements of Responsive Text were helpful to program participants. Six features of Responsive Text were evaluated:

1. words that are pronounced
2. word meanings that are given
3. questions
4. the writing notebook
5. diagrams and pictures
6. the checkup.

Program participants evaluated the amount of help each aspect of Responsive Text on a scale ranging from 0 (not helpful) to 3 (very helpful).

Mean scores for participants at both GE and BED were calculated in order to evaluate their perceptions of how helpful each aspect of Responsive Text was. The mean scores for each area are presented in Table 8. Graphs of these scores are presented in Figure 15 (GE) and Figure 16 (BED).

Table 8 and Figures 15-16 indicate that participants at both GE and BED perceived each design element of Responsive Text to be helpful. The only exception was the writing notebook among participants at GE who only saw this element as "a little helpful" (M = 0.86). At GE the most helpful elements were the diagrams and pictures (M = 2.37), the checkup (M = 2.26), and the words that were pronounced (M = 2.26). At BED the most helpful elements were the questions (M = 2.20), word meanings (M = 2.00), the diagrams and pictures (M = 2.00), and the checkup (M = 2.00).

Table 8. Mean Scores by Program Participants for the Extent to Which Various Design Elements of Responsive Text were Helpful

Design Element	GE	BED
Words that were pronounced	2.26	1.60
Word meanings	2.11	2.00
The questions	2.14	2.20
The notebook	0.86	1.80
The diagrams and pictures	2.37	2.00
The checkup	2.26	2.00

Figure 15.

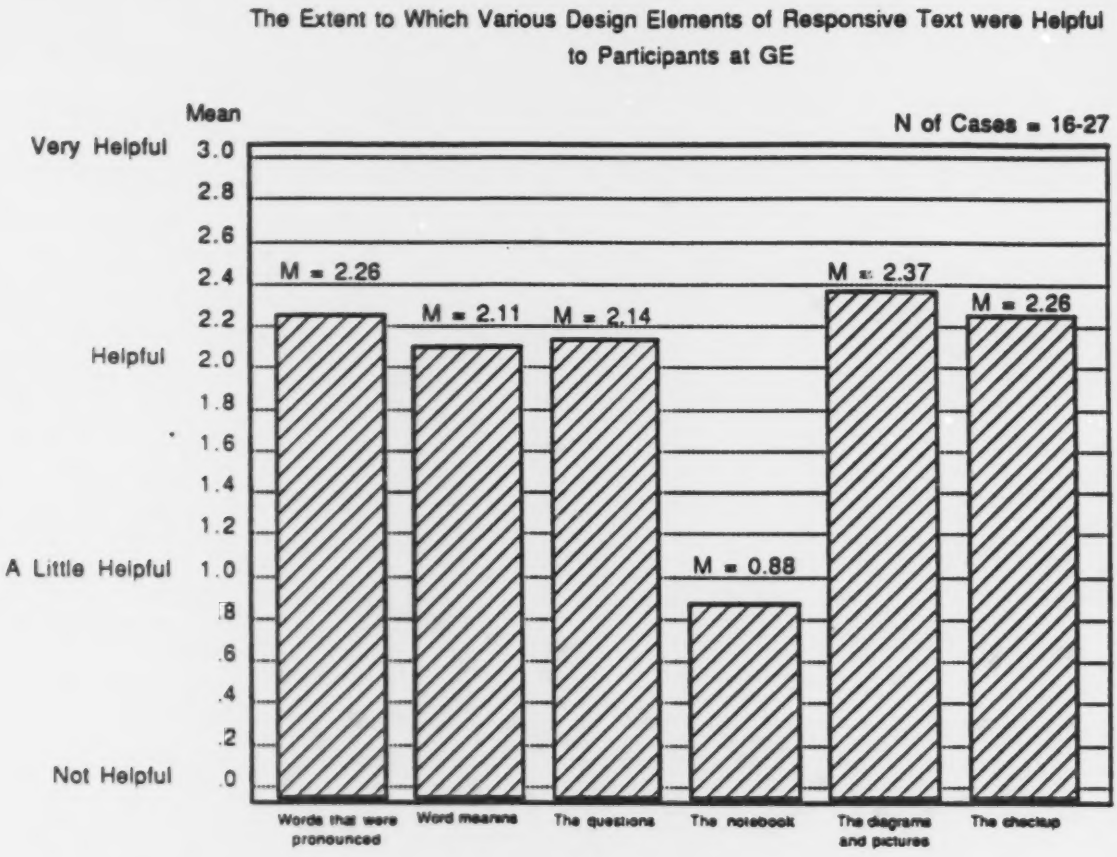
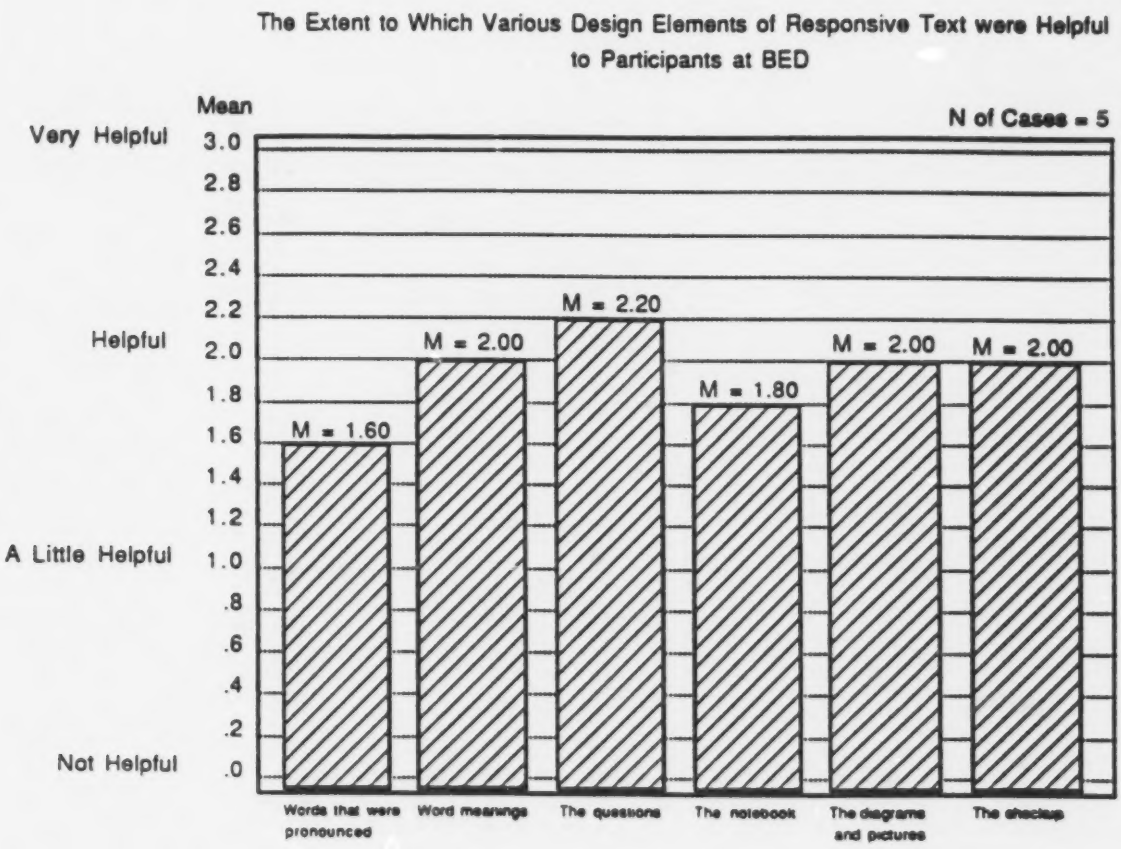

The Extent to Which Various Design Elements of Responsive Text were Helpful to Participants at GE
Mean
N of Cases = 16-27
Very Helpful
Helpful
A Little Helpful
Not Helpful
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
M = 2.26
M = 2.11
M = 2.14
M = 0.88
M = 2.37
M = 2.26
Words that were pronounced
Word meanings
The questions
The notebook
The diagrams and pictures
The checkup

Figure 16.


The Extent to Which Various Design Elements of Responsive Text were Helpful to Participants at BED
Mean
N of Cases = 5
Very Helpful
Helpful
A Little Helpful
Not Helpful
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
.0
M = 1.60
M = 2.00
M = 2.20
M = 1.80
M = 2.00
M = 2.00
Words that were pronounced
Word meanings
The questions
The notebook
The diagrams and pictures
The checkup

Discussion

QUESTION 1: To what extent did the literacy levels of individuals increase as a result of their participation in the project, especially with respect to the comprehension and composition of workplace literacy materials?

It is clear that literacy levels of participants increased substantially as a result of their participation in this program, especially with respect to the comprehension and composition of workplace literacy materials. Four separate sources of data consistently confirm this pattern; instructors perceived these changes in their students, supervisors perceived these changes in their employees, participants perceived these changes in themselves, and measures of comprehension and composition used in this evaluation indicate, on average, significantly greater scores on post-tests.

What is especially impressive about these data is that, on average, each constituency with a stake in the program's outcome perceived important gains to have been made in literacy performance. Gains seen in the classroom by instructors and participants were also translated into higher level performance on literacy tasks in the workplace where they were significant enough to be noticed by supervisors. Thus, it is clear that these gains in literacy performance are sufficiently powerful to generalize out of the classroom and into the workplace of program participants.

While gains in all aspects of literacy were found among program participants it is useful to note that the greatest gain perceived by instructors, supervisors, and participants at GE was in reading comprehension and the greatest gain perceived by instructors, supervisors, and participants at BED was in writing. These are the two aspects of literacy on which each respective program focused its efforts. This suggests that efforts to improve particular aspects of literacy achieved gains in their target areas and that these gains also transfered to other areas of literacy performance. Gains in reading comprehension at GE were achieved at the same time participants achieved impressive gains in their writing. Gains in writing at BED were achieved at the same time participants achieved impressive gains in their reading, especially in more complex material.

QUESTION 2: To what extent did the increased levels of literacy result in improvement in employee work performance?

Data from two different sources, the Employee/Participant Self-evaluation Form and the Supervisor's Response Form, clearly indicate that increases in literacy performance were

closely associated with gains in employees' work performance. Participants perceived increases in their own work performance and supervisors perceived these increases as well. As indicated in Tables 5-6 and Figures 9-12, program participants demonstrated noticeable gains in:

1. leadership in the workplace
2. initiative in the workplace
3. knowledge of the job
4. self-confidence in the workplace
5. quality of work
6. quantity of work
7. level of responsibility

The only area in which gains were not demonstrated was in absenteeism.

Most visible to both participants and their supervisors was a noticeable increase in the self-confidence of program participants in the workplace. This was true at both GE and at BED where the highest mean scores were assigned by participants and their supervisors to increases in self-confidence in the workplace.

Interestingly, the data in Tables 5 and 6 suggest that supervisors at GE perceived slightly greater increases in each area of work performance when compared to participants' perceptions but participants perceived slightly greater increases in each work performance area when compared to their supervisors' perceptions at BED. The reason for this difference between program sites is not clear. It is possible that the reading comprehension gains that were more noticeable at GE had a more direct effect on measures of work performance included in this evaluation. It would be useful in future projects to evaluate the separate contribution made by gains in reading and in writing to work performance measures. Undoubtedly these relationships will be complex and dependent upon the work responsibilities of each employee. Still, it would be useful to explore the nature of reading and writing relationships with work performance. It raises the question as to which area of literacy, reading or writing, yields greater gains in work performance for individual employees. The answer to this question has important consequences for the design of future programs that attempt to improve literacy in the workplace and increase work performance.

QUESTION 3: To what extent does Responsive Text provide an effective tool for supporting the developing literacy needs of employees in workplace settings?

The data from this evaluation clearly demonstrate that Responsive Text is a powerful tool for developing literacy and, at the same time, for improving work performance among employees at both General Electric and the Burlington Electric Department. Participants found Responsive Text to be useful for developing reading skills, for developing writing skills, for

understanding technical documents at work, and for learning new things about work. According to participants at both GE and BED, Responsive Text was especially useful for developing reading skills and for learning about new things at work. It appears that Responsive Text may be a particularly effective means to simultaneously develop literacy skills and help employees understand the increasingly more technical aspects of their jobs. The use of a multimedia, hypertext environment as is contained in Responsive Text may become an increasingly important part of the workplace since it appears to provide such a supportive literacy environment for employees.

Participants at GE and BED found several design elements of Responsive Text to be especially helpful to them: the word meanings, the questions, the diagrams and pictures, and the checkup. Two design features were differentially found to be helpful by site location. At GE, participants found the words that were pronounced to be more helpful than did participants at BED. At BED, participants found the notebook to be more helpful than did participants at GE. These differences may reflect either differences in literacy performance levels at the two sites or the fact that instructors at the two sites differentially exploited these two design elements.

Summary

The data in this evaluation indicate that the program at GE and BED significantly increased the literacy levels of program participants, that this program resulted in important gains in a variety of job performance measures, and that Responsive Text is a powerful tool for simultaneously developing literacy and improving work performance.

APPENDIX A:

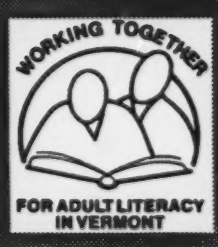
PORTFOLIO DEVELOPED FOR PARTICIPANTS AT GENERAL ELECTRIC

BETTER

EDUCATIONAL

SKILLS

TRAINING



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An Overview of the Portfolio Structure

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**Note: A copy of each text/print sample referred to in the portfolio is appended following page 33.

Participant: _____

Pre–Participation Interview

Let me tell you about this program and answer your questions.

1. How did you hear about this program? _____

_____

2. What were you told about this program? _____

_____

3. Why did you decide to begin this program? _____

_____

4. Would you name 5 things that are easy for you to read or write on the job?

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

5. Would you name 5 things that are hard for you to read or write on the job?

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

6. What do you do when you are expected to read something which you find difficult? _____

_____

_____

7. Have the things that you are expected to read and write on the job changed since you started with GE? How? _____

_____

_____

_____

8. What changes do you expect in your job during the next 6 months?

_____

_____

_____

9. Looking back, how would you describe your experiences in school?

_____

_____

_____

10. How would you like this experience to be different from your school experiences? _____

_____

_____

11. Give me a word that best describes how you read. _____

12. Give me a word that best describes how you write. _____

13. Give me a word that best describes how you feel about starting this program. _____

14. What do you enjoy reading most? _____

_____

15. What do you enjoy writing most? _____

_____

16. What do you want to be able to do when you have completed this program? Rank each item in terms of its importance to you.

Rank *Item*

____ _____

____ _____

____ _____

____ _____

____ _____

17. As you begin this program, to what extent do you feel comfortable and safe about your participation? (check one)

____ I feel very comfortable

____ I feel comfortable

____ I hadn't really thought about this

____ I am a little uncomfortable

____ I am very uncomfortable

18. Reading Habits:

	Here is a list of some things that people often read. How often do you read these things *outside the tutoring session*?			Of those you do read, which are easy for you to read; which are hard?		
	Not at all	Sometimes (once or twice a week)	Regularly (almost every day)	Easy to Read	A Little Hard	Very Hard
Street/traffic signs	☐	☐	☐	○	○	○
Menus	☐	☐	☐	○	○	○
Mail/bills/letters	☐	☐	☐	○	○	○
Labels/instructions	☐	☐	☐	○	○	○
Notes from school	☐	☐	☐	○	○	○
Bank machines, etc.	☐	☐	☐	○	○	○
Comics	☐	☐	☐	○	○	○
Reading books to child	☐	☐	☐	○	○	○
T.V. guides	☐	☐	☐	○	○	○
Newspapers	☐	☐	☐	○	○	○
Magazines	☐	☐	☐	○	○	○
Religious materials	☐	☐	☐	○	○	○
Work materials	☐	☐	☐	○	○	○
Books	☐	☐	☐	○	○	○
Other _____	☐	☐	☐	○	○	○

19. Writing Habits:

	Here is a list of some things that people often write. How often do you write these things *outside the tutoring session*?			Of those you do write, which are easy for you to write; which are hard?		
	Not at all	Sometimes (once or twice a week)	Regularly (almost every day)	Easy to Read	A Little Hard	Very Hard
Checks	☐	☐	☐	○	○	○
Notes/memos	☐	☐	☐	○	○	○
Orders	☐	☐	☐	○	○	○
Recipes	☐	☐	☐	○	○	○
Forms/applications	☐	☐	☐	○	○	○
Reports	☐	☐	☐	○	○	○
Letters	☐	☐	☐	○	○	○
Stories/poems	☐	☐	☐	○	○	○
Articles	☐	☐	☐	○	○	○
Greeting cards	☐	☐	☐	○	○	○
Crossword puzzles	☐	☐	☐	○	○	○
Other _____	☐	☐	☐	○	○	○

20. Outside tutoring sessions, approximately how much time do you read during a typical week? (check one)

____ Not at all

____ A few minutes

____ About an hour

____ Two to three hours

____ Four or more hours

21. Outside tutoring sessions, approximately how much time do you write during a typical week? (check one)

____ Not at all

____ A few minutes

____ About an hour

____ Two to three hours

____ Four or more hours

Participant: _____

Reading Assessment

I. Warm Up

A. Signs in Context

Directions: *Provide participant with one of the instructions below. Check which instructions were given. Record miscues. Mark correct responses with C. Mark substitutions above item. Mark no responses by circling the item. Mark teacher's pronunciation with T. Total correct responses at bottom.*

Instructions: ____ Please read me these signs.

____ (If too hard) Please tell we what each sign says.

____ (If too hard) Which sign says:

____ Emergency Eye Wash

____ Safety Glasses Required

____ Caution Hot

Signs:

CAUTION HOT

EMERGENCY EYE WASH

SAFETY GLASSES REQUIRED

B. Reading the Round Red Tag

Directions: *Ask the two questions. Record the responses. Provide the participant with one of the instructions below. Check which instructions were given. Record miscues. Mark answers* C *or* X.

Questions: 1. Have you seen this tag? Y N

2. Can you tell me what it is for? Y N

Instructions: ____ I'd like you to read it to me if you don't mind.

____ (If too hard) See if you can point to these words on the sign:

____ Danger

____ Do not operate

____ Date

Red Tag:

DANGER

MAN WORKING ON

THIS EQUIPMENT

DO NOT OPERATE

SIGNED

SECTION DATE

OPERATION OF THIS PRIMARY DISCONNECT WILL ENDANGER THE PERSON WORKING ON THIS EQUIPMENT

1. Do not operate this equipment until the SIGNER has removed the tag.

2. This tag shall be removed only by the signer.

3. Any employee violating these instructions will be subject to DISMISSAL.

GENERAL ELECTRIC COMPANY

II. Reading Assessment: Level One

A. Decoding: Printed word list.

Directions: *Read instructions below. Record miscues. Mark correct responses with C. Mark substitutions above item. Mark no responses by circling the item. Mark teacher's pronunciation with T. Total correct responses at bottom.*

Instructions: I'd like you to try reading each of these words. Tell me when you would like to skip a word.

Men

Women

Hot

Danger

No Smoking

Safety Glasses Required

High Voltage

No eating or smoking, this area may contain hazardous material.

Caution

Cycle

Start

Run

Jog

Stop

Emergency Stop

Continuous

Visitor Parking

Handicap Parking

General Electric

Combustible

____ Total Correct

B. Comprehension: Opening Doors Selections

Directions:

- *Ask students which narrative they want to read.*
- *Have students read 1 narrative and the passage "Rags."*
- *Have students read selection orally or silently.*
- *After each page, ask the comprehension questions below.*
- *Score each answer as correct (1 point), partial (1/2 point), or incorrect (0 points).*
- *Score for gist, not word accuracy of responses.*
- *Allow student to refer back to the passage to answer questions.*
- *Record total correct scores. (5 points for each passage. 10 total points.)*

AN ACCIDENT THAT CHANGED MY LIFE

_____ 1. After page 1: Why was this person in Bristol, Vermont?

(Because there are many places to hunt.)

(He was hunting.)

_____ 2. After page 3: Why was this deer scared?

(The three hunters had scared it.)

_____ 3. After page 5: What was the problem in this story?

(This man had shot one of the hunters.)

_____ 4. Where did this hunter run for help?

(To his brother's house.)

_____ 5. Why was his brother shaking?

(He was scared.)

_____ TOTAL

LEFT-HANDED

_____ 1. After page 1: What was this student's problem?
(He was left-handed.)
(He had a teacher who made him feel ashamed.)

_____ 2. When did this student's problem begin?
(When he started school.)
(In the first grade.)

_____ 3. Who made this student feel ashamed?
(His teacher.)
(His first grade teacher.)

_____ 4. After page 3: Why did the teacher come to this student's desk?
(To make the student change the pencil to the right hand.)

_____ 5. After page 5: If this had happened to you, how would you feel? Why?
(Accept answers that are logically explained.)

_____ TOTAL

RAGS

_____ 1. What should you do with an old, worn rag?
(You should place it in a rag barrel.)

_____ 2. What should you put in the cribs?
(One time rags.)

_____ 3. Where should you put most types of rags?
(In the rag barrel.)

_____ 4. What should not be put in the rag barrel?
(A rag that has fallen in a cast pot or that is heavily contaminated with lead.)

_____ 5. Where will the rag barrel be sent?
(To the vendor.)

_____ TOTAL

_____ TOTAL COMPREHENSION SCORE (1 Narrative + Rags)

♦ GO TO WRITING SAMPLE ON PAGE 16 ♦

III. Reading Assessment: Level Two

A. Comprehension: Manufacturing a Jet Engine

Directions:

- *Read the instructions below.*
- *Have each participant read the first column.*
- *Ask the first five questions.*
- *Have each participant read the remainder of the passage.*
- *Ask the final five questions.*
- *Score each answer as correct (1 point), partial (1/2 point), or incorrect (0 points).*
- *Score for gist, not accuracy of response.*
- *Allow students to refer back to the passage to answer the questions.*
- *Record the total score.*

Instructions: I'd like you to read this passage called "Manufacturing Jet Engines." You may read it silently or outloud. When you get to the end of the first column I'd like you to stop. I will ask you five questions about what you have read. Then you will finish reading. I will ask you five more questions at the end. If you wish, you will be able to look back at the passage to help you answer each question. Is there anything that isn't clear?

AFTER READING THE FIRST COLUMN

_____ 1. What happens during the first stage of manufacturing jet engines?
(The engineering and design of the engine takes place.)

_____ 2. What takes place during the third stage?
(The engine is assembled.)

_____ 3. Where are the effects of high temperatures and pressures calculated?
(In the engineering department.)

_____ 4. As each part is designed, what is important to keep in mind?
(Safety, fuel efficiency, reliability, weight. – Only 1 is necessary for correct response.)

_____ 5. What types of materials are used to make parts?
(High temperature metal alloys, non-metallic composites, and flexible plastics.)

_____ TOTAL

AFTER READING THE ENTIRE PASSAGE

_____ 1. How many different manufacturing sections are there?
(Four.)

_____ 2. What types of engine parts are subject to the most stress?
(Parts that rotate.)

_____ 3. Who provides the raw materials that are used to manufacture jet engines?
(Outside vendors.)

_____ 4. About how long does it take to complete the sub-assembly process?
(About twelve weeks.)

_____ 5. What happens after the entire engine is assembled?
(It is tested and inspected.)

_____ TOTAL

_____ TOTAL COMBINED SCORE FOR BOTH PASSAGES

B. Comprehension: Introduction to Hazardous Materials

Directions:

- *Read the instructions below.*
- *Have the participant read the first half. (Through "What Effects can Hazardous Material Produce?")*
- *Ask the first five questions.*
- *Have each participant read the remainder of the passage.*
- *Ask the final five questions.*
- *Score each answer as correct (1 point), partial (1/2 point), or incorrect (0 points).*
- *Score for gist, not word accuracy of response.*
- *Allow students to refer back to the passage to answer the questions.*
- *Record the total score.*

Instructions: I'd like you to read this passage called "Introduction to Hazardous Material." You may read it silently or out-loud. When you get to the middle, I'd like you to stop. (Show the participant where to stop – At the end of "What Effects Can Hazardous Materials Produce?") I will ask you five questions about what you have read. Then you will finish reading. I will ask you five more questions at the end. If you wish, you will be able to look back at the passage to help you answer each question. Is there anything that isn't clear?

AFTER READING THE FIRST HALF

(Through "What Effects Can Hazardous Materials Produce?")

_____ 1. Why did GE produce this booklet?
(To inform people about safety and health in the workplace.)

_____ 2. How can any material become hazardous?
(When it is handled incorrectly.)

_____ 3. When do things like water or vitamins become hazardous?
(At high doses.)

_____ 4. What type of exposure would it be if a chemical splashed on you and you washed it off quickly?
(An acute exposure.)

_____ 5. What is a chronic effect?
(Something that results from a long-term exposure.)

_____ TOTAL

AFTER READING THE SECOND HALF

_____ 1. What is HazCom?
(A comprehensive hazard communication program.)

_____ 2. List four ways in which you can protect yourself from hazardous material?
(Know the hazardous materials that you work with, practice good housekeeping, use the right protective equipment, and participate in a monitoring program.)

_____ 3. What kinds of people work at GE to protect you?
(Safety professionals, the environmental control professionals, medical professionals, the industrial hygiene staff. - Need to name only two.)

_____ 4. What should you do if you have problems with personal protective equipment?
(Report it to your supervisor.)

_____ 5. Why does GE believe that you should know about hazardous materials?
(To protect yourself, your neighbors, and the environment.)

_____ TOTAL

_____ TOTAL COMBINED SCORE FOR BOTH PASSAGES

Name: _____

Vermont General Electric
Pre-Participation Writing Sample

Directions: A new employee has asked you about how to bid on a job change. Write a description explaining how to bid on a job change. If you are uncertain about how to bid on a job change, write a brief description explaining how a person can get this information.

Participant: _____

Post–Participation Interview

1. Name 5 things that have become easier for you to read or write on the job since your participation in this program

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

2. Name 5 things that remain hard for you to read or write on the job since your participation in this program?

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

3. How would you rate each of the following aspects of the program?

Your Computer Experiences:

____ Very helpful

____ Helpful

____ Somewhat helpful

____ Not very helpful

____ Not at all helpful

Your Writing Experiences:

____ Very helpful

____ Helpful

____ Somewhat helpful

____ Not very helpful

____ Not at all helpful

Your Reading Experiences:

____ Very helpful

____ Helpful

____ Somewhat helpful

____ Not very helpful

____ Not at all helpful

4. Give me a word that best describes how you read. _____

5. Give me a word that best describes how you write. _____

6. Give me a word that best describes how you feel about your participation in this program. _____

7. What was the part of this program that you enjoyed the most? _____

_____

8. What was the part of this program that you enjoyed the least? _____

_____

9. Now that you have completed this program, how do you feel about each of these items which, earlier, you had considered important to you?

Rank	Item	I am better at	I am about same	I am worse at
1	_____	_____	_____	_____
2	_____	_____	_____	_____
3	_____	_____	_____	_____
4	_____	_____	_____	_____
5	_____	_____	_____	_____

10. During your participation in this program, to what extent did you feel comfortable and safe? (check one)

____ I felt very comfortable

____ I felt comfortable

____ I hadn't really thought about this

____ I felt a little uncomfortable

____ I felt very uncomfortable

11. Now that you have completed this program, how do you feel about your ability to do each of these tasks:

Item	I am better at	I am about same	I am worse at
a. Reading things at work	_____	_____	_____
b. Reading things at home	_____	_____	_____
c. Writing things at work	_____	_____	_____
d. Writing things at home	_____	_____	_____

12. Reading Habits:

	Here is a list of some things that people often read. How often do you read these things *outside the tutoring session*?			Of those you do read, which are easy for you to read; which are hard?		
	Not at all	Sometimes (once or twice a week)	Regularly (almost every day)	Easy to Read	A Little Hard	Very Hard
Street/traffic signs	☐	☐	☐	○	○	○
Menus	☐	☐	☐	○	○	○
Mail/bills/letters	☐	☐	☐	○	○	○
Labels/instructions	☐	☐	☐	○	○	○
Notes from school	☐	☐	☐	○	○	○
Bank machines, etc.	☐	☐	☐	○	○	○
Comics	☐	☐	☐	○	○	○
Reading books to child	☐	☐	☐	○	○	○
T.V. guides	☐	☐	☐	○	○	○
Newspapers	☐	☐	☐	○	○	○
Magazines	☐	☐	☐	○	○	○
Religious materials	☐	☐	☐	○	○	○
Work materials	☐	☐	☐	○	○	○
Books	☐	☐	☐	○	○	○
Other _____	☐	☐	☐	○	○	○

13. Writing Habits:

	Here is a list of some things that people often write. How often do you write these things *outside the tutoring session*?			Of those you do write, which are easy for you to write; which are hard?		
	Not at all	Sometimes (once or twice a week)	Regularly (almost every day)	Easy to Read	A Little Hard	Very Hard
Checks	☐	☐	☐	○	○	○
Notes/memos	☐	☐	☐	○	○	○
Orders	☐	☐	☐	○	○	○
Recipes	☐	☐	☐	○	○	○
Forms/applications	☐	☐	☐	○	○	○
Reports	☐	☐	☐	○	○	○
Letters	☐	☐	☐	○	○	○
Stories/poems	☐	☐	☐	○	○	○
Articles	☐	☐	☐	○	○	○
Greeting cards	☐	☐	☐	○	○	○
Crossword puzzles	☐	☐	☐	○	○	○
Other _____	☐	☐	☐	○	○	○

14. Outside tutoring sessions, approximately how much time do you read during a typical week? (check one)

____ Not at all

____ A few minutes

____ About an hour

____ Two to three hours

____ Four or more hours

15. Outside tutoring sessions, approximately how much time do you write during a typical week? (check one)

____ Not at all

____ A few minutes

____ About an hour

____ Two to three hours

____ Four or more hours

Participant: _____

Reading Assessment

I. Warm Up

A. Signs in Context

Directions: *Provide participant with one of the instructions below. Check which instructions were given. Record miscues. Mark correct responses with* C. *Mark substitutions above item. Mark no responses by circling the item. Mark teacher's pronunciation with* T. *Total correct responses at bottom.*

Instructions: _____ Please read me these signs.

_____ (If too hard) Please tell we what each sign says.

_____ (If too hard) Which sign says:

_____ Emergency Eye Wash

_____ Safety Glasses Required

_____ Caution Hot

Signs:

CAUTION HOT

EMERGENCY EYE WASH

SAFETY GLASSES REQUIRED

B. Reading the Round Red Tag

Directions: *Ask the two questions. Record the responses. Provide the participant with one of instructions below. Check which instructions were given. Record miscues. Mark answers* C *or* X.

Questions: 1. Have you seen this tag? Y N

2. Can you tell me what it is for? Y N

Instructions: ____ I'd like you to read it to me if you don't mind.

____ (If too hard) See if you can point to these words on the sign:

____ Danger

____ Do not operate

____ Date

Red Tag:

DANGER

MAN WORKING ON

THIS EQUIPMENT

DO NOT OPERATE

SIGNED

SECTION DATE

OPERATION OF THIS PRIMARY DISCONNECT WILL ENDANGER THE PERSON WORKING ON THIS EQUIPMENT

1. Do not operate this equipment until the SIGNER has removed the tag.

2. This tag shall be removed only by the signer.

3. Any employee violating these instructions will be subject to DISMISSAL.

GENERAL ELECTRIC COMPANY

II. Reading Assessment: Level One

A. Decoding: Printed word list.

Directions: *Read instructions below. Record miscues. Mark correct responses with C. Mark substitutions above item. Mark no responses by circling the item. Mark teacher's pronunciation with* T. *Total correct responses at bottom.*

Instructions: I'd like you to try reading each of these words. Tell me when you would like to skip a word.

Men

Women

Hot

Danger

No Smoking

Safety Glasses Required

High Voltage

No eating or smoking, this area may contain hazardous material.

Material

Caution

Cycle

Start

Run

Jog

Stop

Emergency Stop

Continuous

Visitor Parking

Handicap Parking

General Electric

Combustible

____ Total Correct

B. Comprehension: Opening Doors Selections

Directions:

- *Ask students which narrative they want to read.*
- *Have students read 1 narrative an the passage "Rags."*
- *Have students read selection orally or silently.*
- *After each page, ask the comprehension questions below.*
- *Score each answer as correct (1 point), partial (1/2 point), or incorrect (0 points).*
- *Score for gist, not word accuracy of responses.*
- *Allow student to refer back to the passage to answer questions.*
- *Record total correct scores. (5 points for each passage. 10 total points.)*

AN ACCIDENT THAT CHANGED MY LIFE

____ After page 1: Why was this person in Bristol, Vermont?

(Because there are many places to hunt.)

(He was hunting.)

____ After page 3: Why was this deer scared?

(The three hunters had scared it.)

____ After page 5: What was the problem in this story?

(This man had shot one of the hunters.)

____ Where did this hunter run for help?

(To his brother's house.)

____ Why was his brother shaking?

(He was scared.)

____ TOTAL

LEFT-HANDED

____ After page 1: What was this student's problem?
(He was left-handed.)
(He had a teacher who made him feel ashamed.)

____ When did this student's problem begin?
(When he started school.)
(In the first grade.)

____ Who made this student feel ashamed?
(His teacher.)
(His first grade teacher.)

____ After page 3: Why did the teacher come to this student's desk?
(To make the student change the pencil to the right hand.)

____ After page 5: If this had happened to you, how would you feel? Why?
(Accept answers that are logically explained.)

____ TOTAL

RAGS

____ 1. What should you do with an old, warn rag?
(You should place it in a rag barrel.)

____ 2. What should you put in the cribs?
(One time rags.)

____ 3. Where should you put most types of rags?
(In the rag barrel.)

____ 4. What should not be put in the rag barrel?
(A rag that has fallen in a cast pot or that is heavily contaminated with lead.)

____ 5. Where will the rag barrel be sent?
(To the vendor.)

____ TOTAL

____ TOTAL COMPREHENSION SCORE (1 Narrative + Rags)

♦ GO TO WRITING SAMPLE ON PAGE 32 ♦

III. Reading Assessment: Level Two

A. Comprehension: Manufacturing a Jet Engine

Directions:

- *Read the instructions below.*
- *Have each participant read the first column.*
- *Ask the first five questions.*
- *Have each participant read the remainder of the passage.*
- *Ask the final five questions.*
- *Score each answer as correct (1 point), partial (1/2 point), or incorrect (0 points).*
- *Score for gist, not accuracy of response.*
- *Allow students to refer back to the passage to answer the questions.*
- *Record the total score.*

Instructions: I'd like you to read this passage called "Manufacturing Jet Engines." You may read it silently or outloud. When you get to the end of the first column I'd like you to stop. I will ask you five questions about what you have read. Then you will finish reading. I will ask you five more questions at the end. If you wish, you will be able to look back at the passage to help you answer each question. Is there anything that isn't clear?

AFTER READING THE FIRST COLUMN

_____ 1. What happens during the first stage of manufacturing jet engines?
(The engineering and design of the engine takes place.)

_____ 2. What takes place during the third stage?
(The engine is assembled.)

_____ 3. Where are the effects of high temperatures and pressures calculated?
(In the engineering department.)

_____ 4. As each part is designed, what is important to keep in mind?
(Safety, fuel efficiency, reliability, weight. – Only 1 is necessary for correct response.)

_____ 5. What types of materials are used to make parts?
(High temperature metal alloys, non–metallic composites, and flexible plastics.)

_____ TOTAL

AFTER READING THE ENTIRE PASSAGE

_____ 1. How many different manufacturing sections are there?
(Four.)

_____ 2. What types of engine parts are subject to the most stress?
(Parts that rotate.)

_____ 3. Who provides the raw materials that are used to manufacture jet engines?
(Outside vendors.)

_____ 4. About how long does it take to complete the sub–assembly process?
(About twelve weeks.)

_____ 5. What happens after the entire engine is assembled?
(It is tested and inspected.)

_____ TOTAL

_____ TOTAL COMBINED SCORE FOR BOTH PASSAGES

B. Comprehension: Introduction to Hazardous Materials

Directions:

- *Read the instructions below.*
- *Have the participant read the first half. (Through "What Effects can Hazardous Material Produce?")*
- *Ask the first five questions.*
- *Have each participant read the remainder of the passage.*
- *Ask the final five questions.*
- *Score each answer as correct (1 point), partial (1/2 point), or incorrect (0 points).*
- *Score for gist, not word accuracy of response.*
- *Allow students to refer back to the passage to answer the questions.*
- *Record the total score.*

Instructions: I'd like you to read this passage called "Introduction to Hazardous Material." You may read it silently or out-loud. When you get to the middle, I'd like you to stop. (Show the participant where to stop – At the end of "What effects Can Hazardous Materials Produce?") I will ask you five questions about what you have read. Then you will finish reading. I will ask you five more questions at the end. If you wish, you will be able to look back at the passage to help you answer each question. Is there anything that isn't clear?

AFTER READING THE FIRST HALF

(Through "What Effects Can Hazardous Materials Produce?")

_____ 1. Why did GE produce this booklet?
(To inform people about safety and health in the workplace.)

_____ 2. How can any material become hazardous?
(When it is handled incorrectly.)

_____ 3. When do things like water or vitamins become hazardous?
(At high doses.)

____ 4. What type of exposure would it be if a chemical splashed on you and you washed it off quickly?
(An acute exposure.)

____ 5. What is a chronic effect?
(Something that results for a long-term exposure.)

____ TOTAL

AFTER READING THE SECOND HALF

____ 1. What is HazCom?
(A comprehensive hazard communication program.)

____ 2. List four ways in which you can protect yourself from hazardous material?
(Know the hazardous materials that you work with, practice good housekeeping, use the right protective equipment, and participate in a monitoring program.)

____ 3. What kinds of people work at GE to protect you?
(Safety professionals, the environmental control professionals, medical professionals, the industrial hygiene staff. - Need to name only two.)

____ 4. What should you do if you have problems with personal protective equipment?
(Report it to your supervisor.)

____ 5. Why does GE believe that you should know about hazardous materials?
(To protect yourself, your neighbors, and the environment.)

____ TOTAL

____ TOTAL COMBINED SCORE FOR BOTH PASSAGES

Name: _____

Vermont General Electric
Post–Participation Writing Sample

Directions: A new employee has asked you about how to bid on a job change. Write a description explaining how to bid on a job change. If you are uncertain about how to bid on a job change, write a brief description explaining how a person can get this information.

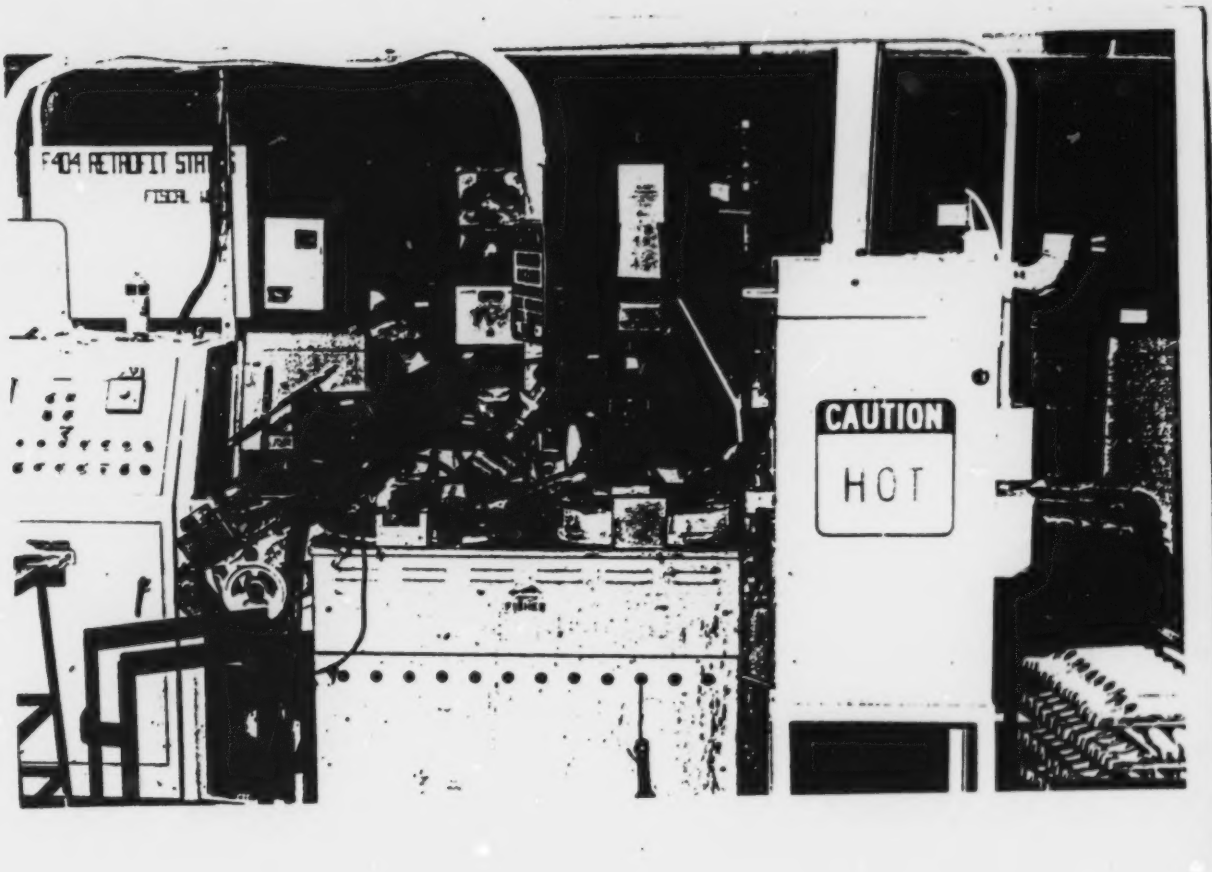
Participant: _____

Teacher's Perception Of Improvement Scale

Directions: Rate the participant's improvement since the beginning of this session in each area. Use a score on each item from 0 (no improvement) to 9 (very great improvement).

0	1	2	3	4	5	6	7	8	9
no improvement		some improvement		moderate improvement			great improvement		very great improvement

1. Comprehension of expository, workplace materials _____
2. Comprehension of narrative materials _____
3. Decoding ability _____
4. Vocabulary knowledge _____
5. Interest in reading _____
6. Interest in writing _____
7. Participation in group activities _____
8. Ability to use Responsive Text _____
9. Interest in using Responsive Text _____
10. Writing ability _____



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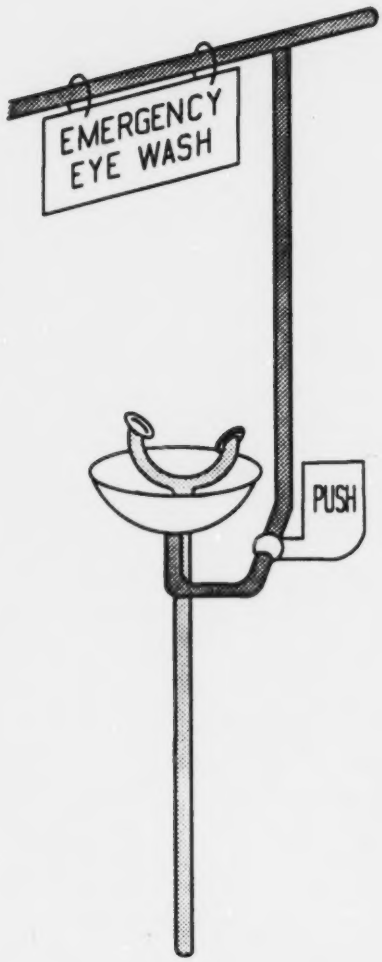
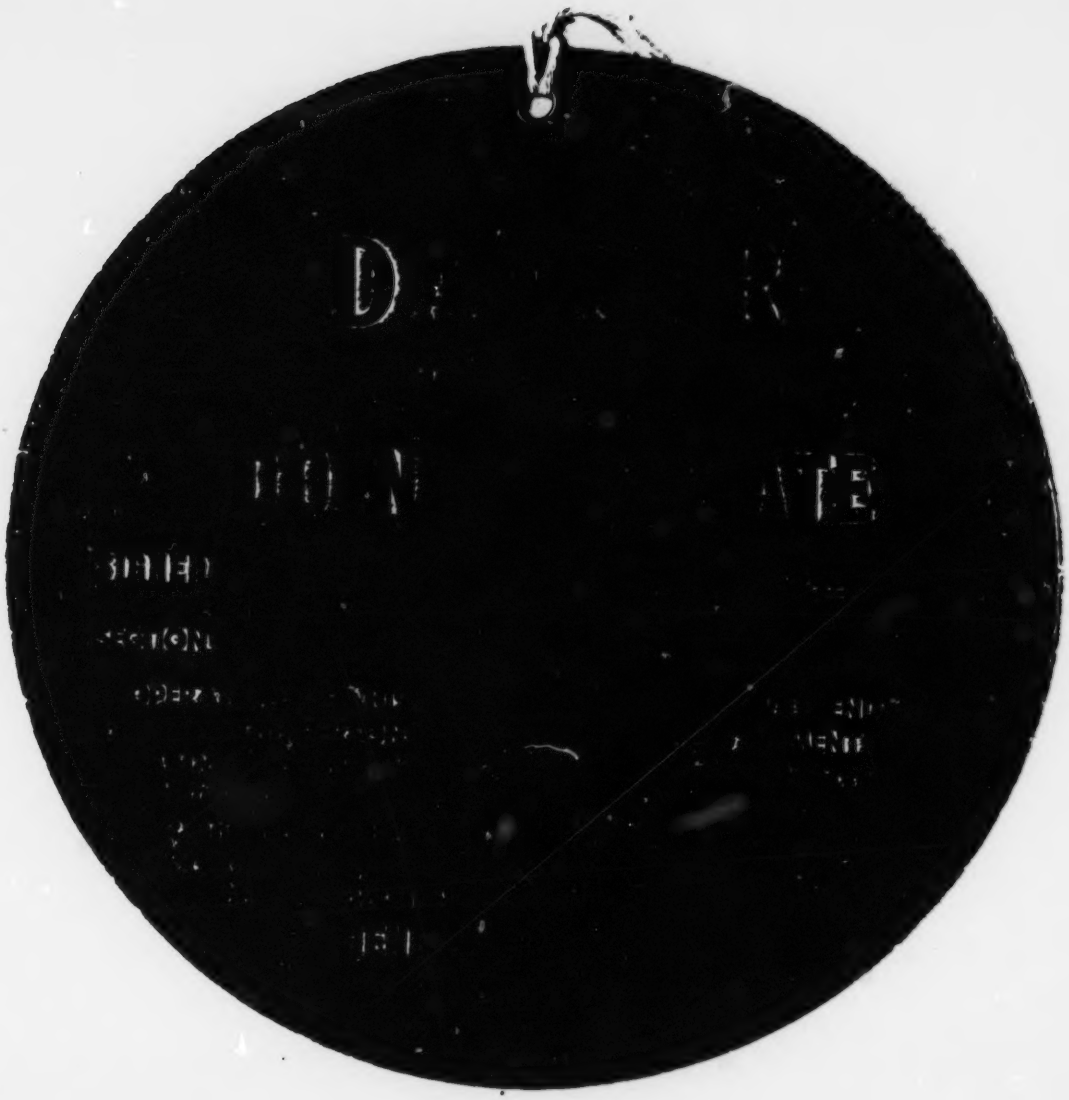

EMERGENCY
EYE WASH
PUSH

SAFETY GLASSES REQUIRED



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Men

Women

Hot

Danger

No Smoking

Safety Glasses Required

High Voltage

No eating or smoking, this area may contain hazardous material.

Caution

Cycle

Start

Run

Jog

Stop

Emergency Stop

Continuous

Visitor Parking

Handicap Parking

General Electric

Combustible

AN ACCIDENT THAT CHANGED MY LIFE

by
Randy Gaboriault

Illustrations
by
Joel Beckwith

Opening Doors Books
Box 379
Bristol, Vermont 05443

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Illustrations by Joel Beckwith

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To all hunters, young and old.

103

I will always remember what happened. I was hunting back in Nov of '78 on Sunday morning. I had a 20 gauge shotgun. I was using a 20 gauge slug. My brother owned a house in Bristol, VT. In Bristol there are many places to hunt.

I was walking in the woods. A deer came out of the nearby brush. I aimed and fired.

There were three hunters walking toward me. They came through heavy brush in the path of fire. They were not dressed for hunting. I missed the deer because they scared it into running. As it ran I fired.

My slug hit the shoulder of one of them. One of them cried out, "You just shot my brother!" Then he said, "I'm gonna shoot him!"

His brother who I shot said, "Don't shoot him! It won't solve anything."

I was terrified. I ran up to them still shaking. "I will go for help. My brother lives a short way from here."

I ran toward the house screaming, "Help! I just shot someone! Call the Rescue!"

My brother went to the house and called the Rescue.

"Where is he now?"

"Lying on the ground."

My brother was shaking, too.

In a few minutes, she noticed. She got up from her desk and started toward me. So I put the pencil back in my right hand. But it was too late. She grabbed my arm, pulled me from my desk and put me in the bathroom. She shut the lights off and said, "You have to stay here until you can tell me what you did wrong!"

I was left in there for a good hour, being scared of the dark. There was no window.

The teacher got worse as the weeks went by. I didn't dare look up at her. It seemed like whenever I did, she would grab hold of me and take me out of the class, or have me go in the furnace room for half the day.

A couple of weeks went by and the teacher had us all do writing that she put on the blackboard. She looked around toward me and saw me writing with my left hand. She came to my desk and grabbed my pencil out of my hand, then put it in my right hand. She looked so big and I was only seven.

I knew I couldn't write with my right hand. I didn't think that was wrong. My mom had never told me that it was. So when the teacher turned to go back to her desk, I snuck the pencil back in my left hand.

Just because I was left-handed, she didn't have to take it out on me. I don't think it's right for people to be ashamed of being left-handed. I was ashamed when I was in school because my teacher made me feel that way.

When I went to the first grade I thought it would be great to learn about things we need to know, like how to write and counting. I got off the bus and our teachers were at the door to tell us our class. After the bell rang, we went in. We called out our names to the teacher and then started to work. I had a good day. School didn't seem too bad.

Opening Doors Books
Box 379
Bristol, Vermont 05443

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Illustrations by Elayne Sears

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To Mom and Dad

because they were there for me.

LEFT HANDED

by
Lillian
Cram

Illustrations
by
Elayne Sears

LEFT HANDED

RAGS

All rags in the shop should be placed in a rag barrel to be returned to the vendor. This includes old worn rags. The only exception is a rag that has fallen in a cast pot or that is heavily contaminated with lead. One-time rags should no longer be used, but returned to the cribs.

Chapter II
Jet Engines

5. Manufacturing Jet Engines

The manufacture of a jet engine is a highly complex process. Because of the need for passenger safety, high fuel efficiency, and reliable operation, the process must be very precise and carefully controlled.

The overall manufacture of an engine proceeds through three stages: Engineering and Design; Manufacture of Components; and Engine Assembly

Engineering and Design

In the engineering department each of the parts for the engine are designed. The design engineers study in detail the specific conditions and stresses under which each part must function. The effects of high temperatures, pressures, and rotational forces exerted in a running engine are calculated.

After completing this research, each part is designed so that it will do its job safely, reliably, and still be light in weight. A variety of materials are available from which parts can be made, including a number of high temperature metal alloys, non-metallic composite, and even flexible plastics.

Manufacture of Components

The actual production of the various engine parts takes place in one of the four manufacturing sections: a) Rotating Parts, b) Casings, c) Fabricated Structures, and d) Airfoils and Fan Blades.

The conditions within a jet engine subject many engine parts to extreme stress. The rotating parts experience the most stress and must function at temperatures of 1400 degrees Fahrenheit while rotating 11,000 times per minute, generating very large rotational forces. The manufacture of engine parts that can withstand these stresses must be an exacting process.

Engine parts start from raw materials. The selection of appropriate raw materials is an important design decision. Special metal alloys of nickel, cobalt, and titanium have been developed because of their relatively light weight and ability to retain their properties under high temperatures and stresses.

The search for still newer metals and other useful materials is on-going and will make engines lighter in weight and even more fuel efficient. Raw materials are supplied to the manufacturing sections

by outside vendors in the form of forgings, castings, metal sheets, and bar stock that match design specification.

Engine Assembly

In engine assembly the jet engine is constructed. The assembling of the various parts, components, and sub-assemblies into an engine progresses in several steps. The process begins with the building of several sub-assemblies done independently of each other. While one group of workers finishes building the compressor rotor sub-assembly, other groups complete the stator, high pressure turbine rotor, compressor diffuser nozzle and other sub-assemblies. This work may take about twelve weeks to complete.

Once all of the sub-assemblies are brought together and assembled as one, the engine is then put through a variety of sophisticated tests and inspections. Each engine is run through a complete operational cycle and power ranges (this is performed in a test cell). Only when all of the mechanical and performance requirements are met is the engine sent to be prepared and packaged for shipment to a customer.

The manufacture of a jet engine is a detailed, precise, expensive, and complicated process. The coordinated efforts of tens of thousands of people are necessary to manufacture and assemble thousands of engine parts. Hundreds of engines are produced each year and shipped to commercial and military customers around the world. Each engine must be reliable, safe, fuel efficient, and of the highest quality.

Purpose

This booklet is part of the continuing program of the General Electric Company to inform you about safety and health in your workplace.

What is a Hazardous Material?

Any material is hazardous if it is handled in such a way that people come into contact with it in amounts that can cause personal injury or property damage. The actual hazard of a material is created by circumstances; under certain conditions of use or misuse, where there is a likelihood that a material will have a harmful effect. Just as a car can cause injury if it is handled carelessly, so too, chemicals can be harmful if handled incorrectly.

The hazard of any material is determined by the chemical, physical, and biological properties of the material and the possibility of exposure to that material.

Hazard = Toxicity X Exposure

A material that is packaged and labeled properly, stored carefully in accordance with accepted practice, and handled correctly by trained people, presents no practical hazard. During handling, the use of engineering controls, fume hoods, masks, chemical workers' goggles and other protective equipment minimizes the possibility of exposure and thus minimizes hazard.

Where are Hazardous Materials Found?

Everywhere. Even water and some of the common minerals and vitamins that are essential to human health may have a harmful effect at high doses. On the other hand, it is a basic concept of toxicology that there is a level at which a person may be exposed and suffer no ill effect.

Knowing that hazardous materials are found everywhere, you must be aware and knowledgeable of the specific hazards in your work area. The chemical inventory list and the Material Safety Data Sheets (MSDSs) found in your work area will assist you in identifying and defining the hazardous materials you may encounter. The MSDSs and other operating instructions will help

you define those practices and procedures necessary to perform your work safely.

What Effects Can Hazardous Materials Produce?

Before any damage can be done, the hazardous material must come in contact with or enter the body in a concentration high enough to cause a harmful effect. Although there

are a multitude of exposure routes, the most obvious ones are: ingestion or swallowing; inhalation of materials in the form of vapors, fumes, mists or dusts; eye and skin contact.

Harmful effects may be produced by hazardous materials after acute or chronic exposure. Acute exposure is an exposure that occurs within a short time. Such an exposure may occur during an accidental spill or splash. Chronic exposures are those that occur over an extended period of time.

An ACUTE effect occurs soon after an exposure to a hazardous substance and, in most cases, is temporary. However, the damage may be permanent or even fatal. Examples of acute effects include vomiting, dizziness and throat irritation.

A CHRONIC effect is the result of long-term exposure over a number of months or years. These effects usually show up long after the first exposure and, in many cases, cause permanent damage to the lungs, eyes, central nervous system or other organs.

It is important to remember that even though a toxic substance may not cause an ACUTE effect which would cause you to notice it, it still could cause an effect later in your life. Also, for many hazardous substances, the acute effects can be very different from the chronic effects.

How Can I Protect Myself?

First: Know the hazardous materials that you work with. Your supervisor will assist you.

Second: Practice good housekeeping, good personal hygiene and proper work practices. Again, your supervisor will instruct you in the specific procedures recommended.

Third: Use the recommended personal protective equipment. Use it routinely, take care of it and report any problems to your supervisor. Where such equipment is needed, use only the equipment supplied by the General Electric Company.

The Company specifies and supplies equipment which is designed to provide the kind and level of protection appropriate to the hazard you may encounter.

Fourth: In some cases where particular hazardous exposure may occur, you may be asked to participate in an appropriate monitoring program. Your cooperation in such a program will enable the medical and industrial hygiene staff to further protect you from a potential hazard.

What Is GE Doing About Hazardous Materials?

We're doing a lot. First of all, there are many people here in the plant who work to improve the health and safety of the worker and the working environment.

The safety professionals work to improve situations that could potentially result in accidents or injuries. The environmental control professional is concerned with the effect that the chemicals could have on the air, water and soil around us. We have medical professionals to treat illness or injury and to monitor the health of our employees. Finally, you may see the industrial hygiene staff in the plant observing or monitoring the workplace, and you may even be asked to help by wearing a personal monitoring device.

The crucial person involved in protecting your health and safety is, however, **YOU!** Your cooperation enables the industrial hygienist or the safety specialist to determine whether a toxic hazard exists and, if so, how to protect you. And, most importantly, your knowledge of the chemicals and areas in which you work will help you to protect yourself.

How Do I Find Out About Hazardous Materials?

To ensure you are aware of all of the hazards associated with materials you work with, the General Electric Company has developed a comprehensive hazard communication program called HazCom.

The HazCom program consists of:

1. an inventory of hazardous materials in the workplace.
2. the acquisition of MSDSs which will be readily available for your review in the work area.

3. Labels and other identification systems to identify hazardous materials and,
4. most important, a series of training programs to provide specific information about potentially hazardous materials employees may use.

In addition, General Electric Safety professionals, industrial hygienists, toxicologists, doctors and nurses are actively involved in helping protect their fellow employees and the public. They can provide additional information on any hazardous materials which you may find in the work area.

General Electric believes that you have the right to know about hazardous materials that you encounter in the workplace. Furthermore, GE believes that you have the responsibility to know, so that you can protect yourself, your neighbors, and the environment. A healthy and safe workplace is GE's and your investment in the future.

Hazardous Materials Glossary

Acid: Any chemical which undergoes disassociation in water with the formation of hydrogen ions. Contact with acids may cause severe burns.

ACGIH: Abbreviation for the American Conference of Governmental Industrial Hygienists, a private organization of occupational safety and health professionals that recommends exposure limits for numerous toxic substances.

Alkali: Any chemical substance which forms soluble soaps with fatty acids. Alkalis are also referred to as bases. They may cause severe burns to the skin.

Asphyxiate: Suffocate due to lack of oxygen.

Base: See alkali.

Carcinogen: A substance capable of causing cancer. A material identified as an animal carcinogen does not necessarily cause cancer in humans.

cc: Cubic centimeter. There are 16.4 cc in one cubic inch.

Ceiling Limit: The maximum amount of a toxic substance allowed to be in workroom air at any time during the day.

Central Nervous System: The brain and spinal cord.

Combustible: Able to catch on fire and burn.

Corrosive Material: A chemical that

APPENDIX B:

PORTFOLIO DEVELOPED FOR PARTICIPANTS AT BURLINGTON ELECTRIC DEPARTMENT

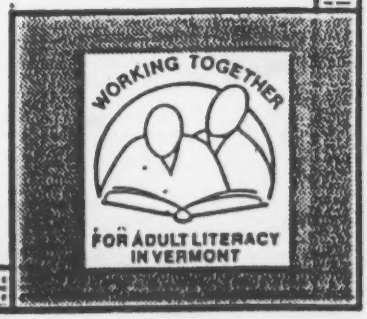
BED

BETTER

EDUCATIONAL

SKILLS

TRAINING



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This assessment was developed by Judy Lashof, Project Director (VT ABE) and Dr. Don Leu, Project Evaluator (University of Syracuse) drawing on the Holistic Assessment Approach developed by Dr. Susan Lytle (University of Pennsylvania) and incorporating a portion of the California Adult Learner's Progress Evaluation Program.

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Participant: _____

Pre–Participation Interview

Let me tell you about this program and answer your questions.

1. How did you hear about this program? _____

_____

2. What were you told about this program? _____

_____

3. Why did you decide to begin this program? _____

_____

4. Would you name 5 things that are easy for you to read or write on the job?
   a. _____
   b. _____
   c. _____
   d. _____
   e. _____

5. Would you name 5 things that are hard for you to read or write on the job?
   a. _____
   b. _____
   c. _____
   d. _____
   e. _____

6. What do you do when you are expected to read something which you find difficult? _____

_____

_____

7. Have the things that you are expected to read and write on the job changed since you started with GE? How? _____

_____

_____

_____

8. What changes do you expect in your job during the next 6 months?

_____

_____

_____

9. Looking back, how would you describe your experiences in school?

_____

_____

_____

10. How would you like this experience to be different from your school experiences? _____

_____

_____

11. Give me a word that best describes how you read. _____

12. Give me a word that best describes how you write. _____

13. Give me a word that best describes how you feel about starting this program. _____

14. What do you enjoy reading most? _____

_____

15. What do you enjoy writing most? _____

_____

16. What do you want to be able to do when you have completed this program? Rank each item in terms of its importance to you.

Rank *Item*

____ _____

____ _____

____ _____

____ _____

____ _____

17. As you begin this program, to what extent do you feel comfortable and safe about your participation? (check one)

____ I feel very comfortable

____ I feel comfortable

____ I hadn't really thought about this

____ I am a little uncomfortable

____ I am very uncomfortable

18. Reading Habits:

	Here is a list of some things that people often read. How often do you read these things *outside the tutoring session*?			Of those you do read, which are easy for you to read; which are hard?		
	Not at all	Sometimes (once or twice a week)	Regularly (almost every day)	Easy to Read	A Little Hard	Very Hard
Street/traffic signs	☐	☐	☐	○	○	○
Menus	☐	☐	☐	○	○	○
Mail/bills/letters	☐	☐	☐	○	○	○
Labels/instructions	☐	☐	☐	○	○	○
Notes from school	☐	☐	☐	○	○	○
Bank machines, etc.	☐	☐	☐	○	○	○
Comics	☐	☐	☐	○	○	○
Reading books to child	☐	☐	☐	○	○	○
T.V. guides	☐	☐	☐	○	○	○
Newspapers	☐	☐	☐	○	○	○
Magazines	☐	☐	☐	○	○	○
Religious materials	☐	☐	☐	○	○	○
Work materials	☐	☐	☐	○	○	○
Books	☐	☐	☐	○	○	○
Other _____	☐	☐	☐	○	○	○

19. Writing Habits:

	Here is a list of some things that people often write. How often do you write these things *outside the tutoring session*?			Of those you do write, which are easy for you to write; which are hard?		
	Not at all	Sometimes (once or twice a week)	Regularly (almost every day)	Easy to Read	A Little Hard	Very Hard
Checks	☐	☐	☐	○	○	○
Notes/memos	☐	☐	☐	○	○	○
Orders	☐	☐	☐	○	○	○
Recipes	☐	☐	☐	○	○	○
Forms/applications	☐	☐	☐	○	○	○
Reports	☐	☐	☐	○	○	○
Letters	☐	☐	☐	○	○	○
Stories/poems	☐	☐	☐	○	○	○
Articles	☐	☐	☐	○	○	○
Greeting cards	☐	☐	☐	○	○	○
Crossword puzzles	☐	☐	☐	○	○	○
Other _____	☐	☐	☐	○	○	○

20. Outside tutoring sessions, approximately how much time do you read during a typical week? (check one)

____ Not at all

____ A few minutes

____ About an hour

____ Two to three hours

____ Four or more hours

21. Outside tutoring sessions, approximately how much time do you write during a typical week? (check one)

____ Not at all

____ A few minutes

____ About an hour

____ Two to three hours

____ Four or more hours

Participant: _____

Reading Assessment

I. Warm Up

A. Signs in Context

Directions: Provide participant with one of the instructions below. Check which instructions were given. Record miscues. Mark correct responses with C. Mark substitutions above item. Mark no responses by circling the item. Mark teacher's pronunciation with T. Total correct responses at bottom.

Instructions: ____Please read me these signs.

_____(If too hard) Please tell me what each sign says.

_____(If too hard) Which sign says:

_____ Eye Wash

_____Safety Glasses Required Beyond This Point

_____Pull

Signs:

PULL

EYE WASH

SAFETY GLASSES REQUIRED BEYOND THIS POINT

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II. Reading Assessment: Level One

A. Decoding: Printed Word list.

Directions: Read instructions below. Record miscues. Mark correct responses with C. Mark substitutions above item. Mark no responses by circling the item. Mark teacher's pronunciation with T. Total correct responses at bottom.

Instructions: I'd like you to try reading each of these words. Tell me when you would like to skip a word.

Hazardous Waste

Combustible Materials

Danger

Do Not Operate

Caution Hot

Men at Work

Kilowatt Hours

PSI

High Voltage

Watts News

Job Vacancy

Employees Only

Eye Wash Station

No Smoking

Hot Dog

Hours

Time Off

Customer Service

Hard Hat Area

Women

Men

Safety Procedures

Personnel

Safety Glasses Required

Use Ear Plugs

Message Due

Burlington Electric Department

_____ Total Correct

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B. Comprehension: Opening Doors Selections

Directions:
* Ask students which narrative they want to read.
* Have students read 1 narrative and the passage "Coal".
* Have students read selection orally or silently.
* After each page, ask the comprehension questions below.
* Score each answer as correct (1 point), partial (1/2 point), or incorrect (0 points).
* Score for gist, not word accuracy of responses.
* Allow student to refer back to the passage to answer questions.
* Record total correct scores. (5 points for each passage. 10 total points).

AN ACCIDENT THAT CHANGED MY LIFE

_____ 1. After page 1: Why was this person in Bristol, Vermont?
(Because there are many places to hunt.)
(He was hunting.)

_____ 2. After page 3: Why was this deer scared?
(The three hunters had scared it.)

_____ 3. After page 5: What was the problem in this story?
(This man had shot one of the hunters.)

_____ 4. Where did this hunter run for help?
(To his brother's house.)

_____ 5. Why was his brother shaking?
(He was scared.)

_____ Total

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LEFT-HANDED

____ 1. After page 1: What was this student s problem?
(He was left-handed.)
(He had a teacher who made him feel ashamed.)

____ 2. When did this student s problem begin?
(When he started school.)
(In the first grade.)

____ 3. Who made this student feel ashamed?
(His teacher.)
(His first grade teacher.)

____ 4. After page 3: Why did the teacher come to this student's desk?
(To make the student change the pencil to the right hand.)

____ 5. After page 5: If this had happened to you, how would you feel? Why?
(Accept answers that are logically explained.)

____ Total

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COAL

_____ 1. About how much coal was needed in 1910 to produce one kilowatt hour of electricity?
(About three pounds.)

_____ 2. Today, what type of fuel is probably used most frequently by electric utility companies to produce electricity?
(Coal.)

_____ 3. How has the use of coal in electric power plants changed since the 1920's?
(Today we need less coal to produce the same amount of electricity.)
(We needed more coal in the 1920's.)
(Now we are more efficient in the use of coal.)

_____ 4. A plant in 1920 used about 30 pounds of coal to produce 10 kilowatt hours of electricity. In 1977 about how much coal would a plant have required to produce the same amount of electricity?
(About 1/3 or 10 pounds of coal.)

_____ 5. Identify five different energy sources used by electric utility companies.
(Coal, oil, gas, nuclear, hydro.)

_____ TOTAL

_____ TOTAL COMPREHENSION SCORE (1 Narrative + Coal)

- Go to Writing Sample on Page 16

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III. Reading Assessment: Level Two

A. Comprehension: Burning Coal

Directions:
* Read the instructions below.
* Have each participant read the first column.
* Ask the first five questions.
* Have each participant read the remainder of the passage.
* Ask the final five questions.
* Score each answer as correct (1 point), partial (1/2 point), or incorrect (0 points).
* Score for gist, not accuracy of response.
* Allow students to refer back to the passage to answer the questions.
* Record the total score.

Instructions: I'd like you to read this passage about burning coal. You may read it silently or out loud. When you are done, I will ask you five questions about what you have read. If you wish, you will be able to look back at the passage to help you answer each question. Is there anything that isn't clear?

_____ 1. When you burn coal what kinds of gasses are released?
(Carbon monoxide and carbon dioxide.)

_____ 2. Two power plants burn the same amount of coal to generate electricity. Plant number 1 produces more carbon monoxide while plant number 2 produces more carbon dioxide. Why is plant number 2 a better power plant?
(It gets all the heat out of the fuel. Thus it makes more electricity from the same amount of coal.)

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3. Why shouldn't we provide too much air when we burn coal to make electricity?
(The air will absorb some of the heat that is released.)

4. Why do we try to burn carbon monoxide (co) to get carbon dioxide (co2)?

5. Why do we always provide just a little bit more air than is required to burn coal?
(To be certain that all of the co is changed to co2.)

TOTAL

B. Comprehension: Introduction to Educational Aid

Directions:
* Read the instructions below.
* Have each participant read the passage.
* Ask the final five questions.
* Score each answer as correct (1 point), partial (1/2 point), or incorrect (0 points).
* Score for gist, not word accuracy of response.
* Allow students to refer back to the passage to answer the questions.
* Record the total score.

Instructions: I'd like you to read this passage called Educational Aid. You may read it silently or out loud. When you finish reading, I will ask you five questions. If you wish, you will be able to look back at the passage to help you answer each question. Is there anything that isn't clear?

_____ 1. How many people must approve your application if you wish to take and educational program and have BED pay for it?
(Three.)

_____ 2. What type of educational program will be paid for by BED?
(Those that directly benefit BED).

_____ 3. If BED requires you to take a course and you receive a grade of "D" who has to pay for the course?
(BED).

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_____ 4. At what point in time will BED give you the money to pay for an educational program?
(At the time you are billed for the program.)

_____ 5. When will BED pay for textbooks required in and educational program?
(When a course is mandated by the department).

_____ TOTAL

Name: _____

Vermont General Electric
Pre–Participation Writing Sample

Directions: A new employee has asked you about how to bid on a job change. Write a description explaining how to bid on a job change. If you are uncertain about how to bid on a job change, write a brief description explaining how a person can get this information.

Participant: _____

Post–Participation Interview

1. Name 5 things that have become easier for you to read or write on the job since your participation in this program

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

2. Name 5 things that remain hard for you to read or write on the job since your participation in this program?

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

3. How would you rate each of the following aspects of the program?

Your Computer Experiences:

____ Very helpful

____ Helpful

____ Somewhat helpful

____ Not very helpful

____ Not at all helpful

Your Writing Experiences:

____ Very helpful

____ Helpful

____ Somewhat helpful

____ Not very helpful

____ Not at all helpful

Your Reading Experiences:

____ Very helpful

____ Helpful

____ Somewhat helpful

____ Not very helpful

____ Not at all helpful

4. Give me a word that best describes how you read. _____

5. Give me a word that best describes how you write. _____

6. Give me a word that best describes how you feel about your participation in this program. _____

7. What was the part of this program that you enjoyed the most? _____

_____

8. What was the part of this program that you enjoyed the least? _____

_____

9. Now that you have completed this program, how do you feel about each of these items which, earlier, you had considered important to you?

Rank	Item	I am better at	I am about same	I am worse at
1	_____	_____	_____	_____
2	_____	_____	_____	_____
3	_____	_____	_____	_____
4	_____	_____	_____	_____
5	_____	_____	_____	_____

10. During your participation in this program, to what extent did you feel comfortable and safe? (check one)

____ I felt very comfortable

____ I felt comfortable

____ I hadn't really thought about this

____ I felt a little uncomfortable

____ I felt very uncomfortable

11. Now that you have completed this program, how do you feel about your ability to do each of these tasks:

Item	I am better at	I am about same	I am worse at
a. Reading things at work	_____	_____	_____
b. Reading things at home	_____	_____	_____
c. Writing things at work	_____	_____	_____
d. Writing things at home	_____	_____	_____

12. Reading Habits:

	Here is a list of some things that people often read. How often do you read these things *outside the tutoring session*?			Of those you do read, which are easy for you to read; which are hard?		
	Not at all	Sometimes (once or twice a week)	Regularly (almost every day)	Easy to Read	A Little Hard	Very Hard
Street/traffic signs	☐	☐	☐	○	○	○
Menus	☐	☐	☐	○	○	○
Mail/bills/letters	☐	☐	☐	○	○	○
Labels/instructions	☐	☐	☐	○	○	○
Notes from school	☐	☐	☐	○	○	○
Bank machines, etc.	☐	☐	☐	○	○	○
Comics	☐	☐	☐	○	○	○
Reading books to child	☐	☐	☐	○	○	○
T.V. guides	☐	☐	☐	○	○	○
Newspapers	☐	☐	☐	○	○	○
Magazines	☐	☐	☐	○	○	○
Religious materials	☐	☐	☐	○	○	○
Work materials	☐	☐	☐	○	○	○
Books	☐	☐	☐	○	○	○
Other _____	☐	☐	☐	○	○	○

13. Writing Habits:

	Here is a list of some things that people often write. How often do you write these things *outside the tutoring session*?			Of those you do write, which are easy for you to write; which are hard?		
	Not at all	Sometimes (once or twice a week)	Regularly (almost every day)	Easy to Read	A Little Hard	Very Hard
Checks	☐	☐	☐	○	○	○
Notes/memos	☐	☐	☐	○	○	○
Orders	☐	☐	☐	○	○	○
Recipes	☐	☐	☐	○	○	○
Forms/applications	☐	☐	☐	○	○	○
Reports	☐	☐	☐	○	○	○
Letters	☐	☐	☐	○	○	○
Stories/poems	☐	☐	☐	○	○	○
Articles	☐	☐	☐	○	○	○
Greeting cards	☐	☐	☐	○	○	○
Crossword puzzles	☐	☐	☐	○	○	○
Other _____	☐	☐	☐	○	○	○

14. Outside tutoring sessions, approximately how much time do you read during a typical week? (check one)

____ Not at all

____ A few minutes

____ About an hour

____ Two to three hours

____ Four or more hours

15. Outside tutoring sessions, approximately how much time do you write during a typical week? (check one)

____ Not at all

____ A few minutes

____ About an hour

____ Two to three hours

____ Four or more hours

Participant:_____

Reading Assessment

I. Warm Up

A. Signs in Context

Directions: Provide participant with one of the instructions below. Check which instructions were given. Record miscues. Mark correct responses with C. Mark substitutions above item. Mark no responses by circling the item. Mark teacher's pronunciation with T. Total correct responses at bottom.

Instructions: ____Please read me these signs.

____(If too hard) Please tell me what each sign says.

____(If too hard) Which sign says:

_____Eye Wash

_____Safety Glasses Required Beyond This Point

_____Pull

Signs:

PULL

EYE WASH

SAFETY GLASSES REQUIRED BEYOND THIS POINT

II. Reading Assessment: Level One

A. Decoding: Printed Word list.

Directions: Read instructions below. Record miscues. Mark correct responses with C. Mark substitutions above item. Mark no responses by circling the item. Mark teacher's pronunciation with T. Total correct responses at bottom.

Instructions: I'd like you to try reading each of these words. Tell me when you would like to skip a word.

Hazardous Waste

Combustible Materials

Danger

Do Not Operate

Caution Hot

Men at Work

Kilowatt Hours

PSI

High Voltage

Watts News

Job Vacancy

Employees Only

Eye Wash Station

No Smoking

Hot Dog

Hours

Time Off

Customer Service

Hard Hat Area

Women

Men

Safety Procedures

Personnel

Safety Glasses Required

Use Ear Plugs

Message Que

Burlington Electric Department .

_____ Total Correct

-24-

B. Comprehension: Opening Doors Selections

Directions:
* Ask students which narrative they want to read.
* Have students read 1 narrative and the passage "Coal".
* Have students read selection orally or silently.
* After each page, ask the comprehension questions below.
* Score each answer as correct (1 point), partial (1/2 point), or incorrect (0 points).
* Score for gist, not word accuracy of responses.
* Allow student to refer back to the passage to answer questions.
* Record total correct scores. (5 points for each passage. 10 total points).

AN ACCIDENT THAT CHANGED MY LIFE

_____ 1. After page 1: Why was this person in Bristol, Vermont?
(Because there are many places to hunt.)
(He was hunting.)

_____ 2. After page 3: Why was this deer scared?
(The three hunters had scared it.)

_____ 3. After page 5: What was the problem in this story?
(This man had shot one of the hunters.)

_____ 4. Where did this hunter run for help?
(To his brother's house.)

_____ 5. Why was his brother shaking?
(He was scared.)

_____ Total

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LEFT-HANDED

_____ 1. After page 1: What was this student's problem?
(He was left-handed.)
(He had a teacher who made him feel ashamed.)

_____ 2. When did this student's problem begin?
(When he started school.)
(In the first grade.)

_____ 3. Who made this student feel ashamed?
(His teacher.)
(His first grade teacher.)

_____ 4. After page 3: Why did the teacher come to this student's desk?
(To make the student change the pencil to the right hand.)

_____ 5. After page 5: If this had happened to you, how would you feel? Why?
(Accept answers that are logically explained.)

_____ Total

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COAL

_____ 1. About how much coal was needed in 1910 to produce one kilowatt hour of electricity?
(About three pounds.)

_____ 2. Today, what type of fuel is probably used most frequently by electric utility companies to produce electricity?
(Coal.)

_____ 3. How has the use of coal in electric power plants changed since the 1920's?
(Today we need less coal to produce the same amount of electricity.)
(We needed more coal in the 1920's.)
(Now we are more efficient in the use of coal.)

_____ 4. A plant in 1920 used about 30 pounds of coal to produce 10 kilowatt hours of electricity. In 1977 about how much coal would a plant have required to produce the same amount of electricity?
(About 1/3 or 10 pounds of coal.)

_____ 5. Identify five different energy sources used by electric utility companies.
(Coal, oil, gas, nuclear, hydro.)

_____ TOTAL

_____ TOTAL COMPREHENSION SCORE (1 Narrative + Coal)

- Go to Writing Sample on Page 16 -

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III. Reading Assessment: Level Two

A. Comprehension: Burning Coal

Directions: * Read the instructions below.

* Have each participant read the first column.

* Ask the first five questions.

* Have each participant read the remainder of the passage.

* Ask the final five questions.

* Score each answer as correct (1 point), partial (1/2 point), or incorrect (0 points).

* Score for gist, not accuracy of response.

* Allow students to refer back to the passage to answer the questions.

* Record the total score.

Instructions: I'd like you to read this passage about burning coal. You may read it silently or out loud. When you are done, I will ask you five questions about what you have read. If you wish, you will be able to look back at the passage to help you answer each question. Is there anything that isn't clear?

_____ 1. When you burn coal what kinds of gasses are released?
(Carbon monoxide and carbon dioxide.)

_____ 2. Two power plants burn the same amount of coal to generate electricity. Plant number 1 produces more carbon monoxide while plant number 2 produces more carbon dioxide. Why is plant number 2 a better power plant?
(It gets all the heat out of the fuel. Thus it makes more electricity from the same amount of coal.)

_____ 3. Why shouldn't we provide too much air when we burn coal to make electricity?
(The air will absorb some of the heat that is released.)

_____ 4. Why do we try to burn carbon monoxide (co) to get carbon dioxide (co2)?

_____ 5. Why do we always provide just a little bit more air than is required to burn coal?
(To be certain that all of the co is changed to co2.)

_____ TOTAL

B. Comprehension: Introduction to Educational Aid

Directions:
* Read the instructions below.
* Have each participant read the passage.
* Ask the final five questions.
* Score each answer as correct (1 point), partial (1/2 point), or incorrect (0 points).
* Score for gist, not word accuracy of response.
* Allow students to refer back to the passage to answer the questions.
* Record the total score.

Instructions: I'd like you to read this passage called Educational Aid. You may read it silently or out loud. When you finish reading, I will ask you five questions. If you wish, you will be able to look back at the passage to help you answer each question. Is there anything that isn't clear?

_____ 1. How many people must approve your application if you wish to take and educational program and have BED pay for it?
(Three.)

_____ 2. What type of educational program will be paid for by BED?
(Those that directly benefit BED).

_____ 3. If BED requires you to take a course and you receive a grade of "D" who has to pay for the course?
(BED).

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_____ 4. At what point in time will BED give you the money to pay for an educational program?
(At the time you are billed for the program.)

_____ 5. When will BED pay for textbooks required in and educational program?
(When a course is mandated by the department).

_____ TOTAL

Name: _____

Vermont General Electric
Post–Participation Writing Sample

Directions: A new employee has asked you about how to bid on a job change. Write a description explaining how to bid on a job change. If you are uncertain about how to bid on a job change, write a brief description explaining how a person can get this information.

Participant: _____

Teacher's Perception Of Improvement Scale

Directions: Rate the participant's improvement since the beginning of this session in each area. Use a score on each item from 0 (no improvement) to 9 (very great improvement).

0	1	2	3	4	5	6	7	8	9
no improvement		some improvement		moderate improvement			great improvement		very great improvement

1. Comprehension of expository, workplace materials _____
2. Comprehension of narrative materials _____
3. Decoding ability _____
4. Vocabulary knowledge _____
5. Interest in reading _____
6. Interest in writing _____
7. Participation in group activities _____
8. Ability to use Responsive Text _____
9. Interest in using Responsive Text _____
10. Writing ability _____

BEST

CHANGES IN JOB PERFORMANCE: SUPERVISOR'S RESPONSE FORM
GE

Employee/participant: _____

Supervisor's name: _____

Plant _____ Shift_____ Phone Extension _____

PART I. READING AND WRITING IN THE WORKPLACE.

Directions: Please answer each of the questions as accurately as possible.

1. List (in order) the three items that are most important for this employee to read on the job.

   i. _____

   ii. _____

   iii._____

2. List (in order) the three items that are most important for this employee to write on the job.

   i. _____

   ii. _____

   iii._____

(Please continue on the next page.)

PART II. EMPLOYEE CHANGES.

Directions: This employee participated in BEST from _____ to _____. Please check the box that best describes your observations of any changes in this employee since he/she began participating in BEST.

Changes in this employee since beginning participation in BEST	**Amount of Change**					
	greatly increased	increased	stayed the same	decreased	greatly decreased	don't know
1. this person's ability to read job-related material	❑	❑	❑	❑	❑	❑
2. this person's ability to write job-related material	❑	❑	❑	❑	❑	❑
3. the frequency with which this person reads in the workplace	❑	❑	❑	❑	❑	❑
4. the frequency with which this person writes in the workplace	❑	❑	❑	❑	❑	❑
5. this person's leadership in the workplace	❑	❑	❑	❑	❑	❑
6. this person's initiative in the workplace	❑	❑	❑	❑	❑	❑
7. this person's knowledge about his/her job	❑	❑	❑	❑	❑	❑
8. this person's self-confidence in the workplace	❑	❑	❑	❑	❑	❑
9. this person's absenteeism from the workplace	❑	❑	❑	❑	❑	❑
10. the quality of this person's work	❑	❑	❑	❑	❑	❑
11. the quantity of this person's work	❑	❑	❑	❑	❑	❑
12. this person's level of responsibility	❑	❑	❑	❑	❑	❑
Other (please describe)						
13. _____	❑	❑	❑	❑	❑	❑
14. _____	❑	❑	❑	❑	❑	❑

Thank You!

PART III. JOB CHANGES.

Directions: Please answer these last three questions about this employee.

i.) Please describe or give examples of the most significant changes in this employee's job performance since s/he began the BEST program.

_____
_____
_____
_____
_____
_____

ii.) Has this employee taken on any additional responsibilities? Please describe the changes.

_____
_____
_____
_____
_____
_____

iii a) Has this employee changed jobs or grade of employment since beginning BEST?

_____

b) If so, describe the change(s).

_____
_____
_____
_____
_____
_____

c) If so, would you say this change required additional responsibilities? Explain.

_____
_____
_____

Thank You!

BEST

RESPONSIVE TEXT EVALUATION FORM

Employee/participant: _____

PART I. Amount of Use

Directions: Please answer each of the questions as accurately as possible. Check the box or write your response as appropriate.

1. About how much time during each class session did you use the computer?

0-5 minutes	10 minutes	20 minutes	30 minutes	40 minutes	50 minutes
❑	❑	❑	❑	❑	❑

2. About how much time during each class session did you use the computer for improving your reading?

0-5 minutes	10 minutes	20 minutes	30 minutes	40 minutes	50 minutes
❑	❑	❑	❑	❑	❑

3. About how much time during each class session did you use the computer for improving your writing?

0-5 minutes	10 minutes	20 minutes	30 minutes	40 minutes	50 minutes
❑	❑	❑	❑	❑	❑

4. About how much time during each class session did you use the computer to improve your job skills.

0-5 minutes	10 minutes	20 minutes	30 minutes	40 minutes	50 minutes
❑	❑	❑	❑	❑	❑

5. About how much time during each class session did you use the computer for other activities?

0-5 minutes	10 minutes	20 minutes	30 minutes	40 minutes	50 minutes
❑	❑	❑	❑	❑	❑

6. Please describe these other activities that you used the computer for.

PART II. Usefulness

Directions: Please answer each of the questions as accurately as possible. Check the box as appropriate.

1. How useful was Responsive Text to you in developing your reading skills?

Not Useful	A Little Useful	Useful	Very Useful
❑	❑	❑	❑

2. How useful was Responsive Text to you in developing your writing skills?

Not Useful	A Little Useful	Useful	Very Useful
❑	❑	❑	❑

3. How useful was Responsive Text to you in helping you to understand technical documents at work?

Not Useful	A Little Useful	Useful	Very Useful
❑	❑	❑	❑

4. How useful was Responsive Text to you in learning about new things at work?

Not Useful	A Little Useful	Useful	Very Useful
❑	❑	❑	❑

5. How helpful was each of these aspects of Responsive Text in understanding what you were reading?

	Not Helpful	A Little Helpful	Helpful	Very Helpful
The words that were pronounced	❑	❑	❑	❑
The word meanings that were given	❑	❑	❑	❑
The questions	❑	❑	❑	❑
The notebook for writing	❑	❑	❑	❑
The diagrams and pictures	❑	❑	❑	❑
The checkup	❑	❑	❑	❑

PART III. Suggestions

Directions: Please answer this question as completely as possible.

1. If you could tell the author of Responsive Text three things that would make it better for other students what would they be?

   a._____

   b._____

   c._____

BEST

CHANGES IN JOB PERFORMANCE: EMPLOYEE/PARTICIPANT SELF-EVALUATION FORM

Employee/participant: _____

Directions: Please check the box that best describes your observations of any changes since you began participating in BEST.

Changes since beginning participation in BEST	**Amount of Change**					
	greatly increased	increased	stayed the same	decreased	greatly decreased	don't know
1. My ability to read job-related material.	❑	❑	❑	❑	❑	❑
2. My ability to write job-related material.	❑	❑	❑	❑	❑	❑
3. The frequency that I read in the workplace.	❑	❑	❑	❑	❑	❑
4. The frequency that I write in the workplace.	❑	❑	❑	❑	❑	❑
5. My leadership in the workplace.	☑	❑	❑	❑	❑	❑
6. My initiative in the workplace.	❑	❑	❑	❑	❑	❑
7. My knowledge about my job.	❑	❑	❑	❑	❑	❑
8. My self-confidence in the workplace.	❑	❑	❑	❑	❑	❑
9. My absenteeism from the workplace.	❑	❑	❑	❑	❑	❑
10. The quality of my work.	❑	❑	❑	❑	❑	❑
11. The quantity of my work.	❑	❑	❑	❑	❑	❑
12. My level of responsibility	❑	❑	❑	❑	❑	❑
Other (please describe)						
13. _____	❑	❑	❑	❑	❑	❑
14. _____	❑	❑	❑	❑	❑	❑

Thank You!

Appendix

Responsive Text Chapters used at GE and BED

GE Materials

1. How Rutland Works
   - A. History of GE Rutland
   - B. Philosophy Statement
   - C. Team Concept
   - D. Overview of the Manufacturing Process at GE Rutland
2. Jet Engine Basics
   - A. Manufacturing Jet Engines/Jet propulsion
   - B. Major Structural Components of a Jet Engine
   - C. Types of Jet Engines
   - D. Jet Engines of the Future
3. Compressor Blade Terminology
   - A. Types of Blades
   - B. Nomenclature
4. Employee Welfare
   - A. Employee Welfare
   - B. Lifting and Carrying
   - C. Electric, Pnuematic, & Hydraulic Safety
   - D. Warning Signs and Notices
   - E. Industrial Hygiene
   - F. Medical Support
   - G. Hazardous Waste
5. Broach Theory
6. Bench Theory
7. Material Handling
8. Gages
   - A. Micrometers/calipers
   - B. Dial Indicators
9. Basic Bench
10. Vertical Broach Operate
11. Information Centers

Burlington Electric Department Materials

1. Power Plant Primer

   A. Introduction/Boiler Components
   B. Steam Turbines/Condensor

2. Basic Electrical Terms

   A. Kilowatt & Kilowatthour
   B. Load, Power Factor, & Diversity

3. The Vermont Commercial Driver's License Manual: Vehicle Inspection

LESSON PLAN CHAPTER 4 SECTION 7

HAZARDOUS WASTE

Skills: Generate questions as a pre-reading activity for increased comprehension

Objectives:

Brainstorm questions to keep in mind as text is read
Read labels, charts and diagrams
Answer comprehension questions in writing after reading the section
Learn to correctly read and fill out hazardous waste labels

Procedure:

1. Have students generate questions to think about as they read the section by asking "What would you like to know about hazardous waste?
   Some possible questions are:
   1. What is hazardous waste?
   2. How does any material become hazardous?
   3. How should it be handled?
   4. How is it disposed of?

2. Do each check-up activity (4 of them)

3. Have students answer the comprehension questions on the worksheet.

WORKSHEET CHAPTER 4 SECTION 7

HAZARDOUS WASTE

1. What is HazCom?

2. What is an MSDS?

   What is it used for?

3. Who can you ask if you are unsure if a material is hazardous?

4. What system does GE use to identfy potential hazardous materials?

5. What do you use a hazardous waste label for?

6. If you are unsure about when to use a hazardous waste label, who can you ask?

7. How do you remove an oil spill?

8. What cannot be disposed of in a hazardous waste barrel?

9. What are the 4 main points to keep in mind in the procedure for storing and disposing of hazardous waste?

Making Workplace Literacy Work

LexIcon Systems
Sharon, Vermont

TYPE OF SITE

★ Business and Education Partnership

TOPICS

★ Adult Basic Education

★ Career Development

★ Workplace Literacy

IMPLEMENTATION

● Basic Computer Skills

★ HyperCard

★ Indicates primary usage(s) at site

● Indicates secondary usage(s) at site

"When you think about it," says Mike Hillinger, "if people can't read, there are only two ways to reach them—by speech or through pictures. That's why we make extensive use of both in our program. And that's why the Macintosh® computer is so appropriate for what we do."

Hillinger, whose background is in reading research, has turned his expertise to the development of computer-based materials in the area of adult basic education. The program he is referring to is a joint venture—between a General Electric aircraft engines factory in Rutland, Vermont, and the Vermont State Department of Education—that is using his materials and approach.

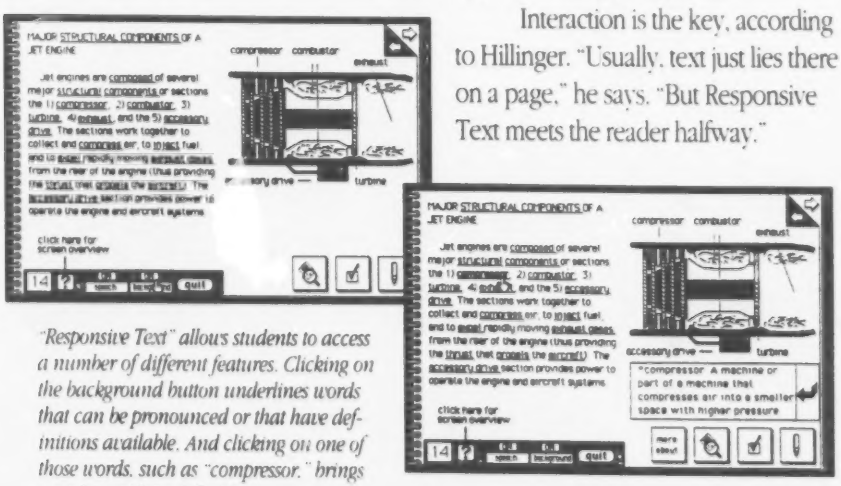
According to Hillinger, GE realized the need for some sort of workplace literacy program when it undertook a skills retraining process—teaching its employees to work in teams instead of individually, and to handle multiple processes rather than the single, repetitive tasks they had handled previously. What the company discovered was that a number of its employees simply couldn't use the training materials provided because they lacked basic learning and literacy skills.

Making text more responsive

To promote these skills, Hillinger turned to the Macintosh computer and *HyperCard*™ software. He says, "The Macintosh user interface makes the computer more accessible, even for inexperienced users, and *HyperCard* makes it much easier to develop appealing computer-based instructional materials. Not being an expert programmer, I appreciate the fact that *HyperCard* and programs like it let the people with the knowledge produce educational materials directly—without involving programmers and a whole lot of other people."

Hillinger used his knowledge to develop a series of *HyperCard* stacks designed to make the written materials more accessible through the addition of speech and graphics. He calls his approach "Responsive Text."

Interaction is the key, according to Hillinger. "Usually, text just lies there on a page," he says. "But Responsive Text meets the reader halfway."


MAJOR STRUCTURAL COMPONENTS OF A JET ENGINE
compressor
combustor
exhaust
turbine
click here for screen overview
quit
"compressor" A machine or part of a machine that compresses air into a smaller space with higher pressure

"Responsive Text" allows students to access a number of different features. Clicking on the background button underlines words that can be pronounced or that have definitions available. And clicking on one of those words, such as "compressor," brings up a box with its definition.

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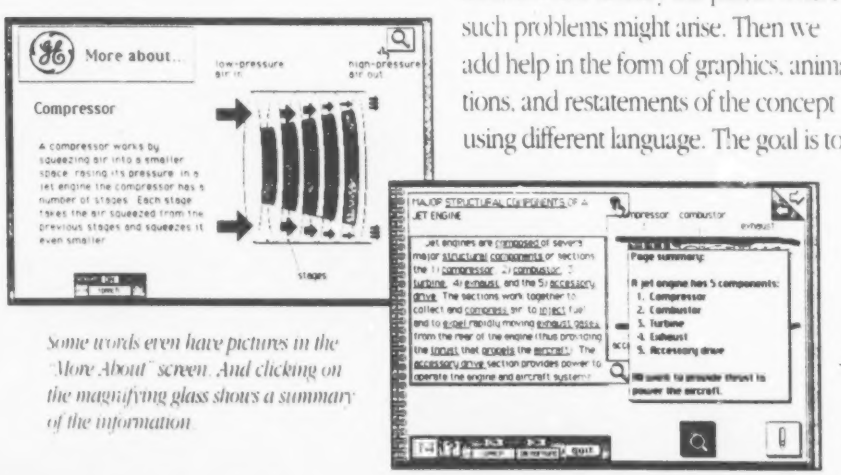
Hillinger explains that the Responsive Text materials offer a number of help features. At the most basic level, employees using the Responsive Text version of the training manuals can simply click on almost any word to hear it spoken. For a number of words, brief textual definitions are also available.

For more complex words and concepts, there is a feature called "More About." More About definitions can be quite involved, and make extensive use of graphics. For example, one option is to explore a graphic of a jet engine to learn where the part in question fits and how it functions.


More about...
low-pressure air in
high-pressure air out
Compressor
A compressor works by squeezing air into a smaller space, raising its pressure. In a jet engine the compressor has a number of stages. Each stage takes the air squeezed from the previous stages and squeezes it even smaller.
stages
MAJOR STRUCTURAL COMPONENTS OF A JET ENGINE
Page summary:
A jet engine has 5 components:
1. Compressor
2. Combustor
3. Turbine
4. Exhaust
5. Accessory drive
quit

Some words even have pictures in the "More About" screen. And clicking on the magnifying glass shows a summary of the information.

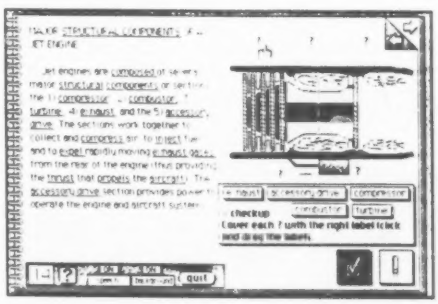
Providing the context

Another feature, called "Closeups," provides relevant background information that can help to put the words into the proper context. As Hillinger explains, "A poor reader may be lacking in background knowledge that a good reader takes for granted. Simply understanding individual words doesn't always give you the meaning. For example, if you don't understand how analogies work, you may get lost reading even relatively simple materials.

"We go through the training manuals and identify the places where such problems might arise. Then we add help in the form of graphics, animations, and restatements of the concept using different language. The goal is to provide another perspective, which may trigger a fuller understanding."

Instilling good learning habits

Yet another feature, "Checkup Questions," is designed to help students learn habits that may further help them with their comprehension. Hillinger explains, "Experienced readers automatically monitor their comprehension as they go along, asking themselves whether they truly understand what they are readin,,. The goal of the Checkup Questions is to promote this self-monitoring in our readers. The purpose of these questions is expressly *not* any sort of evaluation, it is simply to encourage our students to gain this important skill."



This screen shows the "Checkup Questions" available at regular intervals, which help students to check their understanding.

Using the materials

"Basically, our work with the Responsive Text materials can be divided into two categories," says GE project director Judith Lashof. "First, teaching the employees how to use and take best advantage of the material, and second, supplying a context for their reading and learning.

"Part of our role is simply walking them through all of the features. It's often as simple as saying, 'Try this,' and

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'Now, try that.' We've also found it effective to have a teacher sit down at a computer and work through the materials, explaining to the students why she chose to use a particular feature at a particular time—essentially, modeling effective use of Responsive Text. For example, she might say, 'I don't really understand how this information relates to that, so I'm using the More About feature.'"

Providing a context for the exploration is a little more involved. Lashof gives as an example one classroom activity that centered around a very detailed and complex section of the training manual.

"The section covered five different variations on a jet engine, and was extremely complicated," she says. "First, we simply read through the material once and then discussed it. Like me, the students found that their impression of the information was sort of a jumble. So I asked them to define their purpose in learning the material—what specific information they hoped to get out of it.

"We determined that the most important thing to come away with was the distinguishing features of each of the five variations, and their significance. Then we set up a chart for the information and used the Responsive Text features to help us fill in the blanks. At the end of the section, there was a Checkup activity that asked the students to drag the appropriate label to a drawing of each of the five engines. The whole class did this perfectly, but they admitted that they would not have done nearly as well after their first reading."

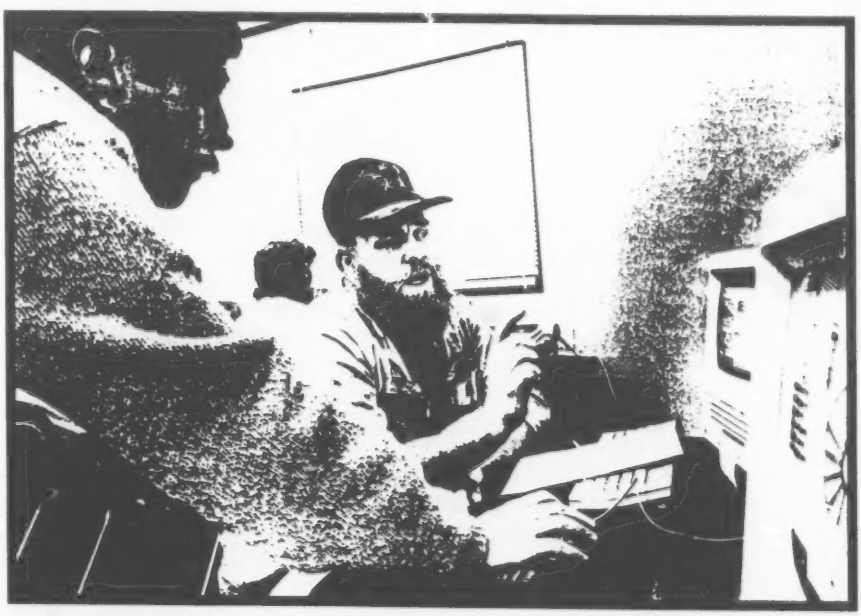
Another classroom activity involved use of an elaborate graphical map of the entire manufacturing process. Lashof explains, "Mike really went to town with *HyperCard* when he created that map. You can click on any operation and be shown a picture of it, click again to get a text description, and even click on individual words in the description for definitions.

"In this case, I was working with three students, each of whom worked in a different place in the plant. To help them gain a better understanding of the overall manufacturing process, I asked them to identify their particular operations and to elaborate on them from their own experience. We moved back and forth between their narratives and the computer-based materials. Creating this kind of interaction between learners offers another motivation to read deeply."

Lashof says that most of her teaching involves moving between activities that set a purpose for reading and activities that center around content. She says that her students need to learn that purposes for reading may vary and still be equally valid.

A program with promise

Although the program is still too young to have yielded solid, quantifiable results, the early indications are extremely promising, according to Lashof. She says, "So far, we're seeing results on a more personal level. For example, one program participant submitted a written suggestion to the company's suggestion program—something he'd never done before. And three of the program participants wrote a memo to the training coordinator with suggestions about the program, which led to a series of meetings and additional correspondence. A big aim of our overall educational effort is to increase employee participation in the company, and these kinds of things show that we're giving them the skills—specifically, the writing skills—they need to accomplish this."



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Lashof also appreciates the fact that the Macintosh enables her to help employees learn highly complex technical concepts—concepts that their literacy skills would otherwise not allow them to tackle—in what she calls a "success-guaranteed fashion." The bottom line for her is that this approach is helping her students learn to do their jobs better, by making the materials they need to learn more accessible to them. "The training manuals were, in some ways, well written," Lashof says, "but it's a very complex technical subject, and they're certainly not what you call plain English. Responsive Text is trying to approach that."

Erasing the distinctions

Hillinger has another perspective on the goals—and effects—of Responsive Text. "If you or I sat down to read some of the training manuals that these people have to deal with," he says, "we, too, would be in a sense illiterate, because we lack the technical background knowledge needed to make sense of these materials.

"To me, that illustrates a key point. My goal is to erase the distinctions between literacy training and basic job skills training—in this case, between *reading* and *reading manuals*. What we are after is not isolated skills, but the ability to comprehend materials that are useful on a very basic, day-to-day level."

Hillinger points out that the Responsive Text approach also helps to deal with one of the most fundamental problems in basic education: fear of the stigma of being identified as "illiterate." In fact, the GE program is not called a "workplace literacy program" by the company. Instead, it is a "job skills training class"—and a very effective and popular one at that.

SITE STATISTICS

TARGET AUDIENCE:

Two distinct groups: "Brush-up students" (people who don't have a major literacy problem, but who need to "get back into reading mode"), and people who have a real reading problem.

PROJECT BEGAN:

Pilot began in February 1990; in July 1990 they implemented the project on a larger scale.

SYSTEM LOCATION:

Two sites—one in each of two manufacturing plants. One is a dedicated lab, and the other a shared facility.

GOALS:

To erase the distinction between literacy and basic job skills—and to improve reading ability and learning skills.

HARDWARE:

10 Macintosh SE computers with hard disks.

SOFTWARE:

HyperCard
Claris Corporation
5201 Patrick Henry Drive
P.O. Box 58168
Santa Clara, CA 95052
1-800-544-8554
(408) 727-8227

TEACHING TIPS

Create interaction between learners. Students become much more motivated and willing to approach the materials in depth when they are working together—and the computer can provide a way to facilitate this collaboration.

Put information into context. The Responsive Text materials are most useful in a larger context of reading strategy, so ask students why they are reading something, and what their learning goal is. Setting these goals provides a framework for use of the software's explanatory features.

Help the students to become comfortable with the technology. One important factor in using Responsive Text is simply ensuring that students stay aware of and tuned in to all of the helpful features it offers. Providing solid orientation early on, so the students become comfortable with the program, can facilitate their ongoing computer use.

Provide incentives to take advantage of the computer. Asking questions and promoting classroom activities that will prompt students to want to delve deeper into the computer-based materials can help them to take full advantage of these materials.

Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010 TLX: 171-576

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employees. Some 20 percent of the participants have already earned GEDs.

(For more information contact Janet Davis, Human Resources Manager, Cumberland Hardwoods, PO Box 6368, Sparta, TN 38583, 615-738-5264.)

GE Aircraft Engines & Burlington Electric In Workplace Project

About two years ago, General Electric Aircraft Engines (GE) in Rutland, Vermont, began to redesign its work processes. The new procedures, which involved work teams and the use of multiple skills by all shop floor employees, revealed that some workers at the plant had literacy problems that affected their performance. GE went to the Vermont Department of Adult Basic Education (ABE) for help. At about the same time, LexIcon Systems, a software developer in Sharon, Vermont, had contacted ABE about working with them to implement its "Responsive Text" software in adult literacy programs. The three groups decided to work together on a new workplace program that would provide basic skills services to employees of the two companies while testing the LexIcon approach to workplace literacy instruction. Financial and in-kind support came from the U.S. Department of Education, the two companies, and Apple Computer.

The software, which runs on Macintosh computers using Hypercard, was developed specifically around the training needs of the two companies, drawing in part on manuals and other workplace materials already in use at GE. "Responsive Text" is also built around the background knowledge and vocabulary that workers already have so as to enhance learning, job performance, and motivation. The LexIcon system of instruction lets students hear the words they read, gives background information about technical terms, and provides periodic summaries and check-up questions.

The program began in July 1990 at General Electric and in January 1991 at the McNeil Power Plant of Burlington Electric. It teaches job-related reading skills from basic to pre-college levels. It also teaches writing skills to more advanced students. Computer instruction is supplemented with classroom teaching of reading comprehension skills. The companies and the provider groups jointly interviewed and selected the teachers (there are two). Workers are given released time for their participation, with five hours of classes provided weekly to small groups of students during all three shifts.

Although it is too soon to formally evaluate the program, an early unexpected outcome has been that some students have been asking for help in writing ideas for the company suggestion box on how to make improvements in the manufacturing process. Any ideas adopted trigger a cash award. Prior to the program the employees were reluctant to submit ideas because of poor writing skills. The program has also uncovered a need to rewrite many of the standard training manuals being used by the companies so that employees can comprehend them without the intervention of instructors and supervisors. For more details, contact Judy Lashof, Project Director, Vermont Department of Adult Basic Education, 128 Merchants Row, Room 205, Rutland, VT 05701, (802) 775-0617.

Winamac Spring

The Winamac Spring Company, which has a workforce of some 360 people, is a small business located in Winamac, Indiana. The company manufactures heavy duty springs for trucks, tractors, and trailers. Because it is in a relatively isolated rural area, few local training opportunities are available. To make up for that lack and to help upgrade workplace safety, productivity, and product quality, the company decided to provide an on-site workplace program to its 225 hourly workers in cooperation with the El-Tip-Wa Adult Career Center of nearby Logansport. The program, which opened its doors only last October, is funded by a National Workplace Literacy grant of $140,000 from the U.S. Department of Education and matched equally by in-kind contributions from Winamac Spring. The company has built a classroom and equipped it with a television, a videocassette machine, and 10 personal computers. El-Tip-Wa designed the curriculum and provides a project coordinator and teaching assistant. The program serves a wide range of educational needs ranging from basic skills to higher workplace development levels. Most employees, those not needing basic skills help, are being given traditional classroom instruction. Low-skilled employees are getting computer-based instruction, using a program that teaches at different reading, English, and math levels. The curriculum focuses on skills that underlie job specific tasks such as charting gauge and control charts associated with statistical process control, reading blueprints and manuals, and completing accident reports and other forms. Employees are given released time to attend class once every two weeks (in groups of 12-16) and they can remain enrolled indefinitely. All workers are free to spend time on th computers outside of their work hours an when the computers are not in use fo classes. Although the federal grant wi expire at the end of this year, Winama Spring plans to continue the program on i own. For further details contact Joe Holme Personnel Administrator, Winamac Sprin Company, Highway 14 West, PO Box 16(Winamac, IN 46996, (219) 946-6121.

America Works: A Pre-Employment Program Where All Parties Make Money

America Works is a private employme agency that specializes in preparing welfa recipients for and placing them in entr level jobs in the private sector. Founded 1985, the agency presently has offices Hartford, Connecticut, and New York Cit Its services are offered under state gover ment contracts in those two states. T program works like this: Welfare recipier judged to be promising employment pr pects are brought into two- to eight-we orientation and pre-employment traini workshops. During this time, they a taught the demeanor and dress codes need for the workplace and they get brush-up he with job skills they already have. They al receive personal counseling, take part activities designed to build self esteem, a get help with child care, housing, a transportation problems. When this phase the program ends, the trainees apply actual jobs — such as receptionist, admi istrative assistant, stock clerk, bookkeep and electronic assembler — on the basis pre-arranged agreements with employe most of which are small businesses. For t first four months of employment, cons ered a try-out, the salary and benefits of new workers accepted by the businesses paid directly by America Works, wh staff closely monitors each person's p gress through weekly worksite visi providing counseling and other supp services as needed. America Works recei payment from the employers of $6.50 hour per employee, which roughly covers costs during this time. Beyond that, each the two states pays America Works $5,0 for every person who is still employed af seven months and thus likely to be perm nently removed from the welfare rolls. T fees represent a substantial savings o what the states would otherwise spend continued welfare payments (some $12,0 or more annually for a family of three). T businesses that use America Works' s vices also save money. Not only are th payments to America Works lower than

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Responsive Text:
A training environment for literacy and job skills

Michael Hillinger
LexIcon Systems
Beaver Meadow Rd., Sharon VT 05065

Industrial training manuals must often convey sophisticated information to an audience with less than proficient literacy. This paper presents an overview of a hypertext-based system that can compensate for reader deficiencies, serving as an instructional tool for basic literacy skills, as well as means to making job-related information available to training populations with below average reading ability.

Basic literacy would seem a natural prerequisite to understanding conventional training manuals. Yet a study by the Hudson Institute (Johnston & Packer,1987) indicates a divergence between the literacy skills needed to learn and perform jobs and the capabilities of the prospective job force.

This paper outlines a computer-based training environment designed to bridge and, perhaps, narrow that discrepancy.

COGNITIVE COMPONENTS OF READING

Extracting meaning from text is a multi-faceted skill. Among the capabilities are:

Decoding

The earliest skill reading is "breaking the code" (Gough and Hillinger, 1980); understanding that the visual symbols on the page correspond to spoken elements of language. Not only must this code be learned, it must be internalized so the decoding process occurs rapidly and automatically. Poor readers, lacking decoding mastery, focus on the mechanics of "sounding out" words to the detriment of higher-level comprehension processes.

Inferencing

Understanding the written word requires filling in information that is implicit. Causal relationships, correct sequence, and relative importance of information are seldom marked in the text. Like decoding, a good reader makes these assumptions without much conscious effort. Conversely, a poor reader frequently fails to make these inferences and loses information critical to understanding.

Assimilating new knowledge

As readers make a transition from "learning to read" to "reading to learn" the task becomes one of connecting what is new in the text with what knowledge the reader already has. As Chall (1983) notes, readers with good decoding and inference skill will have difficulty with more difficult material if they have insufficient "world knowledge."

Comprehension Monitoring

A sophisticated reader has many *metalinguistic* skills to aid in understanding. For example, good readers monitor comprehension, checking their interpretation of meaning against the text (Baker and Brown, 1984). Poor readers, lacking this skill, may "read" text without comprehension.

RESPONSIVE TEXT

Hypertext is system of connecting multiple documents using explicit links between keywords and further information. Hypertext is usually thought of as an *extensive* medium, using links to explore the relationships between diverse topics (Conklin, 1987). As an aid to literacy, hypertext can also be used as an *intensive* medium with links converging on the text to be read. By enriching the surface text with additional information to aid reading, some of the comprehension burden shifts from the reader to the material to be read. We refer to this kind of organizational scheme as *Responsive Text* because the text can adapt to readers of different ability.

The thrust of our work was to develop a generic medium into which existing print material could be embedded, structuring the computer supports to supplement the cognitive components of reading.

DESIGN

Responsive Text runs on a Macintosh computer using Hypercard®. All actions are carried out using a mouse-controlled cursor. The screen (Figure 1) employs the visual metaphor of a book with "pages" turned by clicking on the corner arrows and page numbers displayed in the lower left corner. Text from the manuals is displayed in the left half of the page while the right half carries diagrams and illustrations from the manuals. A computer "notebook" is available (via the pen icon in the lower right portion of the screen) for students to keep notes or respond to global questions about the material.

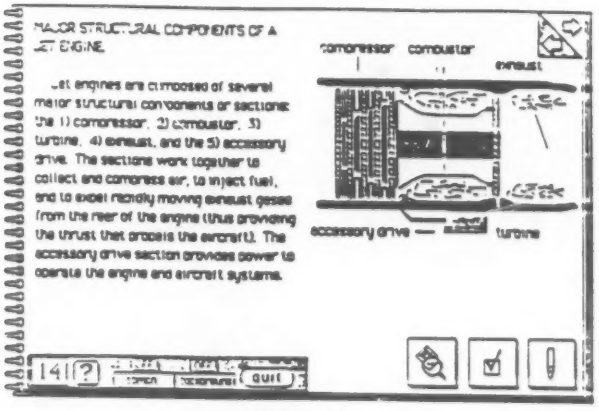
MAJOR STRUCTURAL COMPONENTS OF A JET ENGINE
Jet engines are composed of several major structural components or sections: the 1) compressor, 2) combustor, 3) turbine, 4) exhaust, and the 5) accessory drive. The sections work together to collect and compress air, to inject fuel, and to expel rapidly moving exhaust gases from the rear of the engine (thus providing the thrust that propels the aircraft). The accessory drive section provides power to operate the engine and aircraft systems.
compressor
combustor
exhaust
accessory drive
turbine
quit

Figure 1

Support System

A proficient reader needs only these features to read and understand the material. To supplement the cognitive components of reading we have added speech support to aid in decoding, background information to fill gaps in the reader's world knowledge, Closeup windows to help explain difficult passages, and Checkup questions to aid in comprehension monitoring.

Speech support. The most direct way to aid decoding is to provide a spoken model of the word. In Responsive Text, when speech support is *on* (as indicated by the speech toggle at the bottom of the screen), clicking a word on the screen provides a spoken model. Providing speech for difficult words allows the reader to focus on passage-level comprehension rather than decoding. This is also an excellent way to become proficient decoders (Olson & Wise, 1987).

Responsive Text provides speech for single words. Even using a relatively low digital sampling rates of 5 Khz per second, encoding phrases, sentences, or larger units would require many megabytes of storage. As later versions of the system move to optical storage as a medium, longer components may be encoded. Although synthesized speech could provide greater flexibility and requires less memory the clarity of single words in isolation was of concern.

Background information. Like speech, background can be enabled or disabled using a toggle at the bottom of the page. When enabled, the cursor blinks when pointing to a word or words that have background.

Initial versions of Responsive Text had only one kind of background knowledge but it soon became clear that two levels were necessary. The first level is a short definition that can be rapidly accessed and displayed in a window adjacent to the text (Figure 2). A smaller pool of items have more extensive information available through the *more about...* option. When selected, a *more about...* icon becomes visible along with the short definition (Figure 2). Selecting the *more about...* leads to one or more linked pages of text and images explaining the concept. Choosing *compressor*, for example, leads to a description of a generic compressor, pictures of jet engine compressors, and diagrams showing a compressor's location in a turbojet engine (Figures 3 & 4).

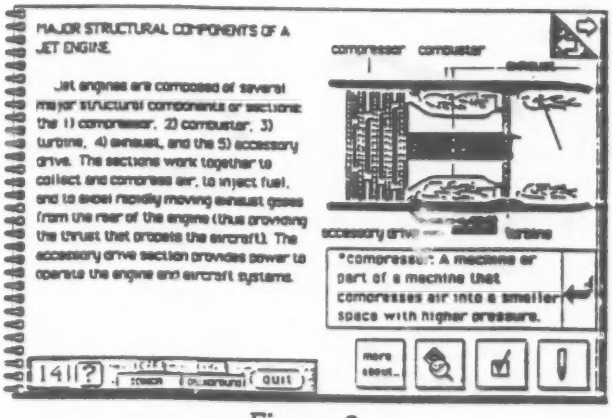
MAJOR STRUCTURAL COMPONENTS OF A JET ENGINE
Jet engines are composed of several major structural components or sections: the 1) compressor, 2) combustor, 3) turbine, 4) exhaust, and the 5) accessory drive. The sections work together to collect and compress air, to inject fuel, and to expel rapidly moving exhaust gases from the rear of the engine (thus providing the thrust that propels the aircraft). The accessory drive section provides power to operate the engine and aircraft systems.
compressor
combustor
exhaust
accessory drive
turbine
*compressor: A machine or part of a machine that compresses air into a smaller space with higher pressure.
more about...
quit

Figure 2

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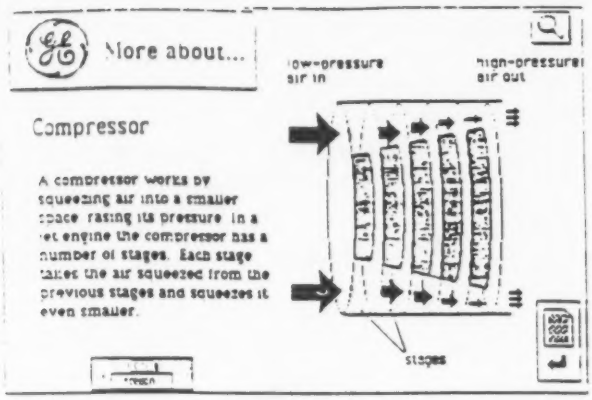
More about...
low-pressure air in
high-pressure air out
Compressor
A compressor works by squeezing air into a smaller space, raising its pressure. In a jet engine the compressor has a number of stages. Each stage takes the air squeezed from the previous stages and squeezes it even smaller.
stages

Figure 3

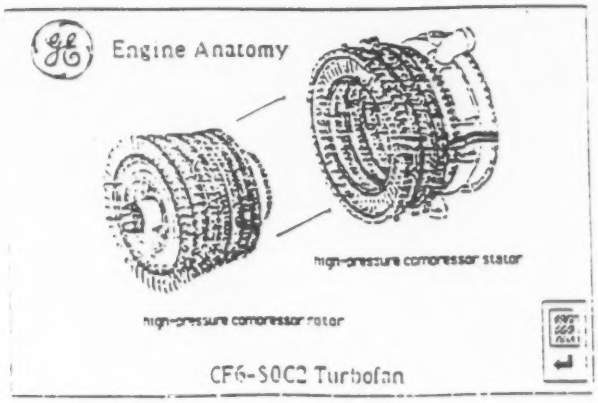

Figure 4

Background information is provided for individual words and groups of words. Some of the terms are technical (e.g., *broach, dovetail, fillet*). Others are low-frequency words that may be not be familiar to the reader (*subsequent, immersed, alleviate*). Often an item has more than one definition based on its context. With the word *forge die*, for example, selecting *forge* yields one definition, *die* another, and *forge die* a third.

Closeup. Even with speech and background support for words, comprehension difficulty can still occur at the passage level. The inability to see implicit information, confusion over the relative importance of ideas, or just the introduction of too many new words and concepts can make a passage incomprehensible. Closeup views provide an alternative explanation for selected parts of text.

Selecting the closeup option (by clicking on the magnifying glass icon) reveals the portions of the text that have closeup information available. Every text page has at least one closeup providing a summary of the information on that page. Other difficult portions of text may be explained using diagrams and/or animation illustrating the point, modifying the text to make implicit information explicit, or removing nonessential words (Figure 5).

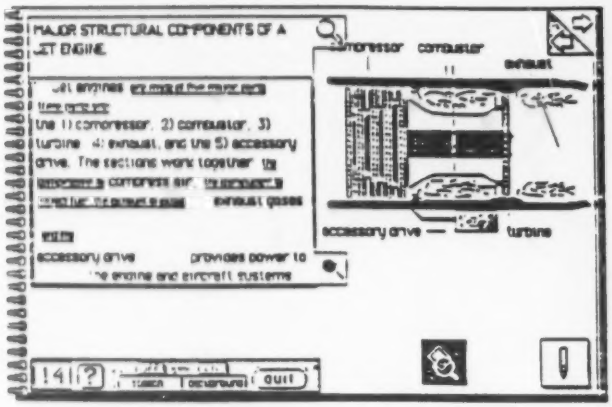

Figure 5

Checkup To encourage comprehension, checkup questions are available on some text pages. These questions, selected at the reader's option, allow them to check their comprehension of the passage. Like closeups, the checkup questions can take a variety of forms. In the example shown in Figure 6, the labels must be moved to their correct location on the engine diagram. Feedback for both correct and incorrect answers can be tied to the text by highlighting the location the answer can be found.

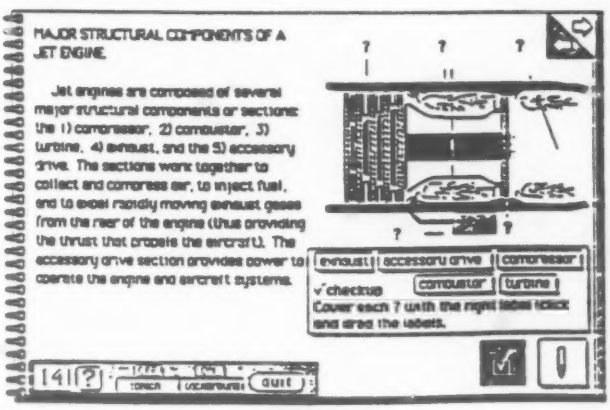
MAJOR STRUCTURAL COMPONENTS OF A JET ENGINE
Jet engines are composed of several major structural components or sections: the 1) compressor, 2) combustor, 3) turbine, 4) exhaust, and the 5) accessory drive. The sections work together to collect and compress air, to inject fuel, and to expel rapidly moving exhaust gases from the rear of the engine (thus providing the thrust that propels the aircraft). The accessory drive section provides power to operate the engine and aircraft systems.
exhaust
accessory drive
compressor
combustor
turbine
checkup
Cover each ? with the right label, click and drag the labels.
quit

Figure 6

DISCUSSION

Designing this environment has sharpened our awareness that literacy needs to be considered in the broader context of job-linked literacy. An individual may have a reading ability adequate for familiar topics and yet be "illiterate" when the task shifts to new material containing new terms and concepts.

While the level of support provided by Responsive Text can vary with the reader's ability, almost all users can benefit from some support. An average reader would know how to pronounce *eject* and *ratio* but might need help with the correct pronunciation of *fillet* (fil' et). A good reader, unfamiliar with metal fabrication, may have little difficulty understanding *shear* or *alleviate* but could use background for a definition of *chamfer*.

Responsive Text, then, can either provide basic literacy practice using job-related materials or provide job training in a supportive environment. These goals are not mutually exclusive and the design of a lesson can vary depending on which of these goals is stressed.

For example, if the goal is to teach basic literacy, then the text should appear as it does in the manuals, even if the writing is poor. In the real world, poor writing is a condition that is often encountered and placing it into a Responsive Text environment can help develop strategies for dealing with it. However, if the goal is to teach a job skill, then the text should be edited for clarity. In fact, with the more powerful presentation methods available in this medium, extensive text should probably be avoided in favor of more visual and interactive approaches.

Because the Responsive Text approach generalizes to readers at many levels of literacy, it can be used without the stigma usually attached to literacy programs. This is of no small value because before workers with literacy problems can be helped they must be found and few feel secure enough to volunteer. However, when Responsive Text is used to present job skills to *all* workers, it is easier for those with reading problems to use the computer supports they need without fear of being detected by their coworkers.

Responsive Text is now undergoing evaluation as part of a Workplace Literacy demonstration project, funded by the U.S. Department of Education. Evaluative data on the effectiveness of this program should be available in 1991.

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Getting back to the basics

"I was so afraid. I didn't know what it said. I watched the person next to me and wrote the same things down because she and I were working on the same parts. After that, I just copied the sheets over each time and hoped nothing had changed."
—"BEST" program participant

by Steve Vatcher, Supervisor, Forge Extrusion and member of the "BEST" Team

From:
Mountain Views
GE Aircraft Engine
Rutland, VT

The above quote came directly from an employee of GE-Rutland who could not read and write well enough to fill out a pre-flight checklist. Nationwide, it is estimated that a quarter of America's workforce lack the basic reading and writing skills necessary to perform in the job market of the 1990's.

The statistics shouldn't surprise you. During World War II, the average job required reading skills on a 4th grade level. Today's jobs require skills on a 9th-12th grade level, and the standards will be even higher by the year 2000. Companies, nation-wide, are responding by offering classes to help employees improve their reading and writing skills.

General Motors spends over $25 million annually training employees in the basic skills of reading and writing. In fact, 75% of Fortune 500 companies have programs to teach employees in these basic skills, including Ford, Domino's Pizza, American Express, AT&T, and, of course . . . General Electric.

Many of our best employees at GE-Rutland have difficulty reading and writing. Unfortunately, most do not want anyone to know they have difficulty, which prevents them from doing anything about it.

Help is available. Vermont Adult Basic Education (ABE), located in the Service Building in downtown Rutland, has been giving instruction in basic skills for many years, at no cost to the students.

For the first time, ABE and GE-Rutland have gotten together to offer courses in the plant funded by the U.S. Department of Education. Instruction is available to anyone who feels they need it, on company time, and during their regular shift.

More information is available by contacting Vermont Adult Basic Education directly at 775-0617, your supervisor, George Pritchard (x1241) or Steve Vatcher (x1533).

"Keep Me Moving"
Supporting our troops in Desert Storm
When you have lots come through your area bearing stickers like the one above, push them through.
They are parts or spares for our engines being used in the Middle East by our Allied troops.
Questions? Ask your supervisor.

GE Aircraft Engines
Rutland, VT

Mountain Views

November, 1991

GE people doing their B.E.S.T.

Inside . . .

...Transition team integrates cell concept

...Haz Mat spill training

...Halloween photos

...Celebrating 40 years of service

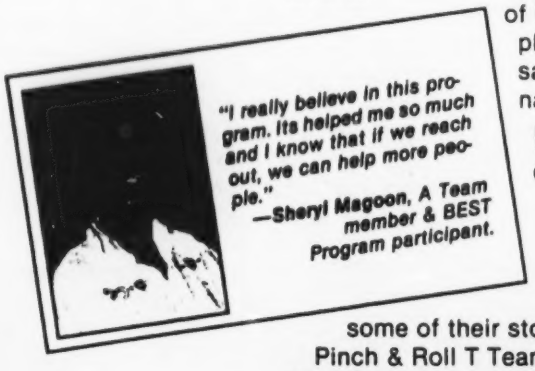
"My supervisor gave me a piece of paper and told me to go fill out the inspection. I had to go back to him and tell him I couldn't do it. I couldn't read."

That's what happened to D Team Member Bill Sullivan two years ago, before he began Basic Education Skills Training—otherwise known as GE Rutland's "BEST" Program.

The BEST Program began in June of 1990, after GE Rutland applied for and received a federal grant to fund workplace literacy projects in the Rutland Operation.

Since that time, the program has served approximately 60 employees in all aspects of basic education skills development. Reading, writing, math, critical thinking, comprehension, problem solving, communication, and more are all offered through the BEST Program to help employees develop to their fullest potential.

"The BEST program provides employees with the critical job skills necessary today, which enables them to function in an ever-changing environment of increasingly complex technology," said Training Coordinator Joyce Vachon.



"I really believe in this program. Its helped me so much and I know that if we reach out, we can help more people."
—Sheryl Magoon, A Team member & BEST Program participant.

Why do employees enroll?

Employees have come to the program with varying abilities. Here are some of their stories:

Pinch & Roll T Team Member Pat Wyman said, "I was scared to death when they said we were going to have to start training for the Change Effort—books we'd have to read, tests we'd have to take. I thought I'd never be able to pass. Then, I spoke to one of the guys in my area who said, 'Why don't you try the BEST program?' So he told me how to go about it, and now I tell everyone I'm going to school."

Bill Sullivan (D Team member and BEST Program participant) reads and discusses team measurements with supervisor Wayne Charron.

"I'm doing this for *me*," said Plant 1 A Team Member Sheryl Magoon. "I didn't realize you could prepare for your GED (General Equivalency Diploma) through the BEST Program, and I had never had the time before."

In addition to the benefits of the BEST Program in the workplace, the program is helping at home.

Forge Tollgate's George Goodwin said, "I wanted to help my kids with school. They'd ask me questions and I wouldn't be able to answer them. The BEST Program has helped me to communicate better with my kids and their teachers, so it's not only helping me, but I think it's helping my kids get a better education."

BEST Program Instructor Sara Randolph of the Western Vermont Adult Basic Education Office said, "Whatever the motivation is, each student comes for some sort of self-improvement. That says a

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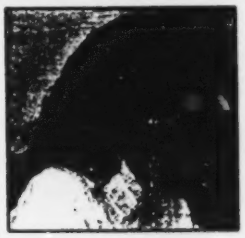

"The key word is courage. Courage to step out and say 'I want to do something for myself and for the company."
—Sarah Randolph, BEST Program Instructor.

"The BEST Program has taught me that I'm as good as the next guy."
—George Goodwin, Forge Tollgate.

It is estimated that 20 to 30 million adult workers in the United States have significant difficulty with basic reading, writing, and math skills.

If you would like more information on GE Rutland's BEST Program, ask your supervisor or contact Joyce Vachon (x1379), George Pritchard (x1242) or any of the BEST Program participants mentioned above.

lot about the kind of person who comes here. That kind of person cares about their job and wants to do well and cares about themself."

She continued, "The key word is *courage*. Courage to step out and say, 'I want to do something for myself and for the company.' "

What can employees/students expect?

- No tests. Each program is individualized according to the employee's needs and students progress at their own rate.
- Classes are held during all shifts and employees may attend during their regular shift hours, without penalization or the need to spend extra time at work. Classes are held twice per week for 1½ hours.
- Confidentiality. The BEST Program Instructors want to make it as easy as possible by offering complete confidentiality to any employee who wishes to participate. "Supervisors are not given progress reports—even if they ask for them," said Joyce Vachon.

How does GE benefit?

Plant 1's Manager of Manufacturing Operations Ray Dube said, "A better educated workforce can do nothing less than make GE Rutland more competitive and make all of our employees more aware and involved."

Manager of Manufacturing Operations Jack Fish said, "We need everyone to contribute. The BEST Program recognizes everyone's ability to contribute and gives employees the skills and self-confidence they need to become team players."

Becoming a contributor

C Team Supervisor Wayne Charron said, "We're here to help people to succeed—not fail. I've seen quite a turnaround in Bill Sullivan's performance. He used to always want the simple jobs. Now he's a better, more thorough, more productive employee."

Sullivan said, "Before I learned to read, every day was a struggle. I was always afraid of losing my job. But people shouldn't feel that way. They should realize the company is offering them a chance to learn and improve themselves."

He continued, "Now I'm more involved. I want to pick up the pace and learn every process out there. This program is going to make a big difference to the company in the long run. They'll have employees who don't just run machines, but understand set-up and how the machine works, so they can figure out what to do if a problem comes up."

How have employees' lives changed?

"My self-confidence level has improved—I've become more sure of myself," said Sheryl Magoon. "My two daughters are very proud that I'm doing this after all these years. I think it's especially helped to bring my oldest daughter and I closer together —she's been teaching *me*."

George Goodwin said, "It's helped me realize that I'm just as good as the next guy. I'm more sociable, more active, I'm not as afraid to express my thoughts, and I'm more willing to listen to others. At home I listen to my kids more, and my fiancee has noticed the change. Also, I've been able to meet people from different parts of the shop through my classes, so I've learned a lot more about the operation."

"I'm beginning to comprehend things easier," said Pat Wyman. "Now I do more reading at home—including reading stories to my seven grandchildren!"

"It's changed how our team operates," said Wayne Charron. "Bill (Sullivan) has been an inspiration to us all, and has brought us together as a team."

"I brought it up," said Bill Sullivan. "I told my teammates, 'I can't read.' I tell them now—if they know someone who can't read—see me. I'm behind the program 100%. I think it's the best thing a company can possibly do."

Small class sizes allow students to relax and enjoy learning.

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